

Claims

1. Method for preparing lithium ^(L1)amide, characterized in that in a first method step lithium ^(L2)metal is reacted with ammonia ^(L3) to form lithium bronze and in a second method step the lithium bronze is reacted with a 1,3-diene or an arylolefin in the presence of a solvent.
butadiene *styrene*
2. Method according to claim 1, characterized in that the 1,3-diene or the arylolefin is butadiene, isoprene, piperylene, dimethylbutadiene, hexadiene, styrene, ^(L6) methyl styrene, naphthalene or anthracene.
3. Method according to claim 1 or 2, characterized in that a stoichiometric quantity of 1,3-diene or arylolefin in relation to the lithium bronze is used in the second reaction step.
4. Method according to one of claims 1 to 3, characterized in that the first method step is also carried out in the presence of a solvent.
5. Method according to one of claims 1 to 4, characterized in that an acyclic or cyclic aliphatic hydrocarbon, an aromatic hydrocarbon or an ether or a mixture of these substances is used as the respective solvent.
6. Method according to claim 5, characterized in that pentane, cyclopentane, hexane, heptane, octane, cyclohexane, toluene, xylene, cumene, ethyl benzene, tetralin, diethyl ether, tetrahydrofuran (THF), 2-methyl-THF, tetrahydropyran, diisopropyl ether, dibutyl ether, dioxan, methyl-tert-butyl ether, glycol ether or a mixture of these substances is used as the solvent.

7. Method according to one of claims 1 to 6,
characterized in that both method steps are carried out
at temperatures of 0 to 30°C.
- 5 8. Method according to one of claims 1 to 7,
characterized in that the ammonia that is released is
reclaimed.
- 10 9. Lithium amide prepared according to a method in
accordance with one of the preceding claims. *product-by-process*

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=> display history full l1-

FILE 'REGISTRY' ENTERED AT 10:16:16 ON 30 JAN 2004

E LITHIUM AMIDE/CN
L1 4 SEA "LITHIUM AMIDE"/CN OR "LITHIUM AMIDE (LI(NH2))"/CN
OR "LITHIUM AMIDE (LINH2)4"/CN OR "LITHIUM AMIDE
(LINH2)4 DIHYDRATE"/CN OR "LITHIUM AMIDE (LINH2)4
TETRAHYDRATE"/CN
E LITHIUM/CN
L2 1 SEA LITHIUM/CN
E AMMONIA/CN
L3 1 SEA AMMONIA/CN
E 1,3-BUTADIENE/CN
L4 1 SEA "1,3-BUTADIENE"/CN
E STYRENE/CN
L5 1 SEA STYRENE/CN
E METHYLSTYRENE/CN
L6 3 SEA METHYLSTYRENE/CN
E ISOPRENE/CN
L7 1 SEA ISOPRENE/CN
E PIPERYLENE/CN
L8 1 SEA PIPERYLENE/CN
E DIMETHYLBUTADIENE/CN
E 1,2-DIMETHYLBUTADIENE/CN
E 1,3-DIMETHYLBUTADIENE/CN
E 2,3-DIMETHYLBUTADIENE/CN
L9 1 SEA "2,3-DIMETHYLBUTADIENE"/CN
E HEXADIENE/CN
L10 1 SEA HEXADIENE/CN
E 1-VINYLNAPHTHALENE/CN
L11 1 S E3
E 2-VINYLNAPHTHALENE/CN
L12 1 SEA 2-VINYLNAPHTHALENE/CN
E 1-VINYLANTHRACENE/CN
L13 1 SEA 1-VINYLANTHRACENE/CN
E 2-VINYLANTHRACENE/CN
L14 1 SEA 2-VINYLANTHRACENE/CN
E 9-VINYLANTHRACENE/CN
L15 1 SEA 9-VINYLANTHRACENE/CN
L16 14 SEA (L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR L11 OR

L12 OR L13 OR L14 OR L15)

FILE 'HCA' ENTERED AT 10:48:05 ON 30 JAN 2004

L17 1907 SEA L1 OR (LITHIUM# OR LI) (W)AMIDE# OR LINH2
L18 75934 SEA L2 OR (LITHIUM# OR LI) (A) (METAL#### OR ELEMENTAL? OR
PURE# OR PURIFIED# OR FREE# OR UNBOND? OR UNBOUND? OR
NONBOND? OR NONBOUND?)
L19 342764 SEA L3 OR AMMONIA# OR NH3
L20 353323 SEA L16 OR BUTADIENE# OR ISOPRENE# OR PIPERYLENE# OR
DIMETHYLBUTADIENE# OR HEXADIENE# OR STYRENE# OR METHYLSTY
RENE# OR VINYLNAPHTHALENE# OR VINYLNAPHTHALENE# OR
VINYLANTHRACENE# OR VINYL##(A) (NAPHTHALENE# OR NAPHTHALENE
OR ANTHRACENE#)
L21 385 SEA (LITHIUM# OR LI) (2A)BRONZ?
L22 1 SEA L21 AND L20
L23 1 SEA L21 AND (?DIENE? OR ?DIENYL?)
L24 45 SEA L17 AND L18 AND L19
L25 4 SEA L24 AND L20
L26 5 SEA L24 AND (?DIENE? OR ?DIENYL?)

FILE 'LCA' ENTERED AT 10:56:19 ON 30 JAN 2004

L27 32135 SEA (PRODUC? OR PROD# OR GENERAT? OR MANUF? OR MFR# OR
CREAT? OR FORM## OR FORMING# OR FORMAT? OR MAKE# OR
MADE# OR MAKING# OR FABRICAT? OR SYNTHESI? OR PREPAR? OR
PREP#)/BI,AB

FILE 'HCA' ENTERED AT 10:56:59 ON 30 JAN 2004

L28 245 SEA L1/P OR L27(2A) (L1 OR L17)
L29 15 SEA L28 AND L24
L30 734239 SEA SOLVEN?
L31 9 SEA L24 AND L30
L32 25 SEA L22 OR L23 OR L25 OR L26 OR L29 OR L31
L33 20 SEA L24 NOT L32

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FILE 'HCA' ENTERED AT 11:01:14 ON 30 JAN 2004

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=> d l32 1-25 cbib abs hitstr hitind

L32 ANSWER 1 OF 25 HCA COPYRIGHT 2004 ACS on STN

139:395745 A process for the preparation of Z-3-dodecenyl E-2-butenolate. Mani, Neelakandha Savithri; Nair, Mangalam Sivasankaran (Council of Scientific and Industrial Research, India). Indian IN 180194 A 19980117, 15 pp. (English). CODEN: INXXAP. APPLICATION: IN 1990-DE1023 19901016.

AB An improved process was disclosed for the prepn. of Z-3-dodecenyl E-2-butenolate which comprised the following steps: (a) reacting monolithium acetylide with ethane oxide in liq. **ammonia** to form 3-butyne-1-ol, (b) chemoselectively alkylating the 3-butyne-1-ol with octyl bromide using **lithium amide** or sodium amide in liq. **ammonia** to form 3-dodecyl-1-ol, (c) partially hydrogenating the 3-dodecyl-1-ol to obtain Z-3-dodecene-1-ol catalyzed by palladium on a support of either calcium carbonate or barium sulfate, and (d) esterifying the aforementioned Z-3-dodecene-1-ol with trans-crotonyl chloride using pyridine in methylene chloride at 0.degree.C to get the desired Z-3-dodecenyl E-2-butenolate.

IT 7439-93-2, Lithium, reactions 7664-41-7, **Ammonia**, reactions 7782-89-0, **Lithium amide**

(process for **prepn.** of Z-3-dodecenyl E-2-butenolate, a sex pheromone from females of *Cylas formicarius elegantulus*)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7664-41-7 HCA

CN **Ammonia** (8CI, 9CI) (CA INDEX NAME)

NH₃

RN 7782-89-0 HCA

CN **Lithium amide** (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IC ICM C07C067-00

CC 26-2 (Biomolecules and Their Synthetic Analogs)

IT 110-86-1, Pyridine, reactions 538-75-0, Dicyclohexylcarbodiimide 1122-58-3, 4-Dimethylaminopyridine 7439-93-2, Lithium, reactions 7664-41-7, **Ammonia**, reactions 7705-08-0, Ferric chloride, reactions 7782-89-0, **Lithium amide** 7782-92-5, Sodium amide 12125-02-9, Ammonium chloride, reactions

(process for **prepn.** of Z-3-dodecenyl E-2-butenate, a sex pheromone from females of *Cylas formicarius elegantulus*)

L32 ANSWER 2 OF 25 HCA COPYRIGHT 2004 ACS on STN

137:95908 Procedure for the **production** of **lithium amide** by reacting lithium with **ammonia** to **lithium bronze** followed by conversion with an 1,3-**alkadiene** or arylalkene. Weiss, Wilfried; Dawidowski, Dirk (Chemetall G.m.b.H., Germany). Ger. DE 10111725 C1 20020725, 4 pp. (German). CODEN: GWXXAW. APPLICATION: DE 2001-10111725 20010309.

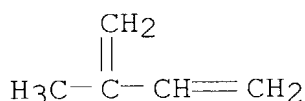
AB **LiNH₂** was **manufd.** by reacting Li with **NH₃** to **lithium bronze** followed by conversion with a 1,3-**alkadiene** or arylalkene. Thus, Li-granulates in hexane was treated with **NH₃** for ca. 3 h up to color change of reaction mixts. from silvery to bronze color and up to liquefying of **lithium bronze**. The resulting **lithium bronze** in Et₂O was treated with **isoprene** for 3 h at 20.degree. to give 99.7% **LiNH₂** in a purity of >99%. **NH₃**, released in the step 2, was recovered.

IT 78-79-5, **Isoprene**, reactions 98-83-9, **Methylstyrene**, reactions 100-42-5, **Styrene**, reactions 504-60-9, **Piperylene** 513-81-5 42296-74-2, **Hexadiene**

(procedure for **prodn.** of **lithium amide** by reacting lithium with **ammonia** to **lithium bronze** followed by conversion with)

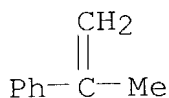
RN 78-79-5 HCA

CN 1,3-Butadiene, 2-methyl- (9CI) (CA INDEX NAME)



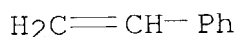
RN 98-83-9 HCA

CN Benzene, (1-methylethenyl)- (9CI) (CA INDEX NAME)

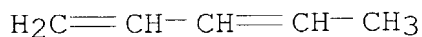


RN 100-42-5 HCA

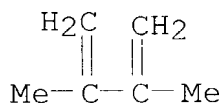
CN Benzene, ethenyl- (9CI) (CA INDEX NAME)



RN 504-60-9 HCA
 CN 1,3-Pentadiene (6CI, 8CI, 9CI) (CA INDEX NAME)



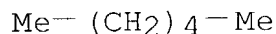
RN 513-81-5 HCA
 CN 1,3-Butadiene, 2,3-dimethyl- (8CI, 9CI) (CA INDEX NAME)



RN 42296-74-2 HCA
 CN Hexadiene (9CI) (CA INDEX NAME)

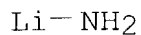
CM 1

CRN 110-54-3
 CMF C6 H14



IT 7782-89-0P, Lithium amide
 (procedure for **prodn.** of lithium
amide by reacting lithium with **ammonia** to
lithium bronze followed by conversion with 1,3-
alkadiene or arylalkene)

RN 7782-89-0 HCA
 CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)



IT 7664-41-7P, Ammonia, preparation
 (procedure for **prodn.** of lithium
amide by reacting lithium with **ammonia** to
lithium bronze followed by conversion with 1,3-
alkadiene or arylalkene)

RN 7664-41-7 HCA
 CN Ammonia (8CI, 9CI) (CA INDEX NAME)



IT 7439-93-2, Lithium, reactions
(procedure for **prodn.** of **lithium**
amide by reacting lithium with **ammonia** to
lithium bronze followed by conversion with 1,3-
alkadiene or arylalkene)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IC ICM C01B021-092

CC 49-5 (Industrial Inorganic Chemicals)

ST **lithium amide manuf; ammonia**
lithium reaction; alkadiene lithium
bronze reaction; arylalkene lithium bronze
reaction

IT **Alkadienes**

(1,3-; procedure for **prodn.** of **lithium**
amide by reacting lithium with **ammonia** to
lithium bronze followed by conversion with)

IT Aromatic hydrocarbons, reactions

(aryl alkenes; procedure for **prodn.** of **lithium**
amide by reacting lithium with **ammonia** to
lithium bronze followed by conversion with)

IT Alkenes, reactions

(aryl; procedure for **prodn.** of **lithium**
amide by reacting lithium with **ammonia** to
lithium bronze followed by conversion with)

IT 78-79-5, **Isoprene**, reactions 91-20-3,
Naphthalene, reactions 98-83-9, **Methylstyrene**,
reactions 100-42-5, **Styrene**, reactions
120-12-7, **Anthracene**, reactions 504-60-9,
Piperylene 513-81-5 42296-74-2,
Hexadiene

(procedure for **prodn.** of **lithium**
amide by reacting lithium with **ammonia** to
lithium bronze followed by conversion with)

IT 7782-89-0P, **Lithium amide**

(procedure for **prodn.** of **lithium**
amide by reacting lithium with **ammonia** to
lithium bronze followed by conversion with 1,3-
alkadiene or arylalkene)

IT 7664-41-7P, **Ammonia**, preparation

(procedure for **prodn.** of **lithium**
amide by reacting lithium with **ammonia** to
lithium bronze followed by conversion with 1,3-
alkadiene or arylalkene)

- IT 7439-93-2, Lithium, reactions
(procedure for **prodn.** of **lithium amide** by reacting lithium with **ammonia** to **lithium bronze** followed by conversion with 1,3-**alkadiene** or arylalkene)
- IT 60-29-7, Diethyl ether, uses 96-47-9 98-82-8, Cumene 100-41-4, Ethylbenzene, uses 108-20-3, Diisopropyl ether 108-88-3, Toluene, uses 109-66-0, Pentane, uses 109-99-9, THF, uses 110-54-3, Hexane, uses 110-71-4, Glyme 110-82-7, Cyclohexane, uses 111-65-9, Octane, uses 119-64-2, Tetralin 123-91-1, Dioxane, uses 142-68-7, Tetrahydropyran 142-82-5, Heptane, uses 142-96-1, Dibutyl ether 287-92-3, Cyclopentane 1330-20-7, Xylol, uses 1634-04-4, Methyl tert-butyl ether
(**solvent**; for **prodn.** of **lithium amide** by reacting lithium with **ammonia** to **lithium bronze** followed by conversion with 1,3-**alkadiene** or arylalkene)
- L32 ANSWER 3 OF 25 HCA COPYRIGHT 2004 ACS on STN
135:101392 First Synthesis and Structural Determination of a Monomeric, Unsolvated **Lithium Amide, LiNH₂**.
Grotjahn, Douglas B.; Sheridan, P. M.; Jihad, I. Al; Ziurys, L. M. (Department of Chemistry, San Diego State University, San Diego, CA, 92182-1030, USA). Journal of the American Chemical Society, 123(23), 5489-5494 (English) 2001. CODEN: JACSAT. ISSN: 0002-7863. Publisher: American Chemical Society.
- AB Alkali metal amides typically aggregate in soln. and the solid phase, and even in the gas phase. In addn., even in the few known monomeric structures, the coordination no. of the alkali metal is raised by binding of Lewis-basic **solvent** mols., with concomitant changes in structure. In contrast, the simplest **lithium amide LiNH₂** has never been made in a monomeric form, even though its structure was theor. predicted several times. Here, the 1st exptl. structural data for a monomeric, unsolvated **lithium amide** are detd. using a combination of gas-phase synthesis and millimeter/submillimeter-wave spectroscopy. All data point to a planar structure for **LiNH₂**. The ro structure of **LiNH₂** has a Li-N distance of 1.736(3) .ANG., an N-H distance of 1.022(3) .ANG., and a H-N-H angle of 106.9(1).degree.. These results are compared with theor. predictions for **LiNH₂**, and exptl. data for oligomeric, solid-phase samples, which could not resolve the question of whether **LiNH₂** is planar or not. In addn., comparisons are made with revised gas-phase and solid-phase data and calcd. structures of **NaNH₂**.
- IT 7782-89-0P, Lithium amide (**LiNH₂**)
(gas-phase **prepn.** and mol. structure of monomeric

unsolvated)
RN 7782-89-0 HCA
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IT 7439-93-2, Lithium, reactions 7664-41-7,
Ammonia, reactions
(reactant for gas-phase prepn. of monomeric unsolvated
lithium amide (LiNH₂))
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7664-41-7 HCA
CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

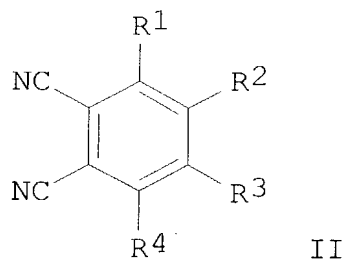
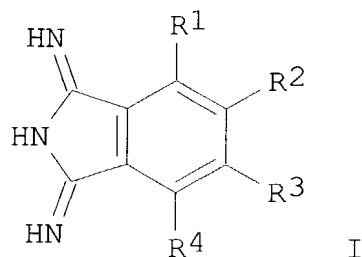
CC 78-5 (Inorganic Chemicals and Reactions)
ST lithium amide monomer prepn structure
IT Molecular structure
(of monomeric unsolvated lithium amide (
LiNH₂))

IT 7782-89-0P, Lithium amide (LiNH₂
)
(gas-phase prepn. and mol. structure of monomeric
unsolvated)

IT 7439-93-2, Lithium, reactions 7664-41-7,
Ammonia, reactions
(reactant for gas-phase prepn. of monomeric unsolvated
lithium amide (LiNH₂))

L32 ANSWER 4 OF 25 HCA COPYRIGHT 2004 ACS on STN
134:222622 Preparation of diiminoisoindolines as intermediates for
phthalocyanines. Seino, Kazuhiro; Misawa, Tsutayoshi; Eda,
Tsunehito; Kumagaya, Yojiro (Mitsui Chemicals Inc., Japan; Yamamoto
Chemicals Inc.). Jpn. Kokai Tokkyo Koho JP 2001064256 A2 20010313,
10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-241687
19990827.

GI



AB Diiminoisoindolines I [R1-R4 = H, halo, NO₂, (un)substituted linear or branched C1-15 alkyl(oxy), (un)substituted C6-20 aryl, etc.; not all of R1-R4 are H, alkyl, aryl], useful as intermediates for optical recording materials, electrophotog. photoreceptors, org. semiconductors, catalysts, etc., are prepd. by cyclocondensation of phthalonitriles II (R1-R4 = same as above) with YC(:X)NH₂ [X = O, S; Y = H, (un)substituted linear or branched C1-15 alkyl, linear or branched C6-20 aryl] in the presence of bases other than alcoholates. Thus, cyclocondensation of 1,2-dicyano-3-(1-isopropyl-2-methyl)propylbenzene with HCONH₂ in the presence of NaOH at 50.degree. for 2 h gave the corresponding diiminoisoindoline deriv. with 87% yield.

IT 7664-41-7, **Ammonia**, reactions
(gas; prepn. of as diiminoisoindolines as intermediates for phthalocyanines from phthalonitriles and amides)

RN 7664-41-7 HCA

CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

IT 7439-93-2, Lithium, reactions 7782-89-0,
Lithium amide
(prepn. of as diiminoisoindolines as intermediates for
phthalocyanines from phthalonitriles and amides)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7782-89-0 HCA
CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IC ICM C07D209-44
ICS B01J023-04; B01J027-24; C07B061-00
CC 27-11 (Heterocyclic Compounds (One Hetero Atom))
Section cross-reference(s): 26, 41, 74, 76
IT 7664-41-7, Ammonia, reactions
(gas; prepn. of as diiminoisoindolines as intermediates for
phthalocyanines from phthalonitriles and amides)
IT 75-12-7, Formamide, reactions 584-08-7, Potassium carbonate
1191-15-7, Diisobutylaluminum hydride 1310-58-3, Potassium
hydroxide, reactions 1310-65-2, Lithium hydroxide 1310-73-2,
Sodium hydroxide, reactions 7439-93-2, Lithium, reactions
7440-09-7, Potassium, reactions 7440-23-5, Sodium, reactions
7580-67-8, Lithium hydride 7646-69-7, Sodium hydride
7782-89-0, Lithium amide 17242-52-3,
Potassium amide 51762-67-5, 1,2-Dicyano-3-nitrobenzene
51762-68-6 75942-40-4 116965-13-0 130107-28-7 130107-57-2
130107-86-7 133863-62-4 144280-13-7 144601-80-9 154435-13-9
167492-82-2 329026-21-3 329026-25-7 329026-26-8 329026-27-9
329026-28-0 329026-29-1 329026-30-4 329026-31-5 329026-32-6
329026-33-7 329026-34-8 329026-35-9 329026-36-0 329026-37-1
329026-38-2 329026-39-3 329026-40-6 329026-41-7 329026-42-8
(prepn. of as diiminoisoindolines as intermediates for
phthalocyanines from phthalonitriles and amides)

L32 ANSWER 5 OF 25 HCA COPYRIGHT 2004 ACS on STN
124:343523 Synthetic and Mechanistic Investigations of
Trimethylsilyl-Substituted Triamidoamine Complexes of Tantalum That
Contain Metal-Ligand Multiple Bonds. Freundlich, Joel S.; Schrock,
Richard R.; Davis, William M. (Department of Chemistry 6-331,
Massachusetts Institute of Technology, Cambridge, MA, 02139, USA).
Journal of the American Chemical Society, 118(15), 3643-55 (English)
1996. CODEN: JACSAT. ISSN: 0002-7863. Publisher: American

Chemical Society.

AB [N3N]Ta:PPh ([N3N]3- = [(Me3SiNCH2CH2)3N]3-) reacts with excess **Li metal** in THF to give [N3N]Ta:PLi, as judged by NMR studies and by reactions with RX at -35.degree., to afford the phosphinidene complexes [N3N]Ta:PR (R = Me, Bu, SiMe3, SiMe2Ph). [N3N]TaCl2 reacts with 2 equiv of LiN(H)R (R = H, CMe3, Ph) to produce 1 equiv of RNH2 and imido complexes [N3N]Ta:NR and with 2 equiv of benzylmagnesium chloride or ((trimethylsilyl)methyl)lithium to afford the alkylidene complexes [N3N]Ta:CHR (R = Ph or SiMe3). The ethylene complex [N3N]Ta(C2H4) is formed quant. upon addn. of 2 equiv of ethylmagnesium chloride to [N3N]TaCl2. [N3N]Ta(C2H4) decomp. in a 1st-order manner in soln. over a period of days at room temp. to give a complex in which a C-N bond in the TREN backbone was cleaved. Alkylation of [N3N]TaCl2 with 2 equiv of RCH2CH2MgX (R = CH3, CH2CH3, CHMe2, CMe3; X = Cl or Br) produces a mixt. of alkylidene and products derived from decompn. of the incipient olefin complex. When R = t-Bu, only an alkylidene complex is formed as a consequence of a sterically disfavored .beta. abstraction process. [N3N]TaCl2 reacts with 2 equiv of vinylmagnesium bromide to afford white cryst. [N3N]Ta(C2H2). An analogous benzyne complex can be prepd. by refluxing [N3N]TaCl2 with 2 equiv of phenyllithium in toluene. [N3N]Ta(C2H4) reacts with a catalytic amt. of phenylphosphine to afford [N3N]Ta:CHMe, while reactions with **NH3**, aniline, or pentafluoroaniline yield [N3N]Ta:NR complexes. In contrast, excess Me3SiAsH2 reacts with [N3N]Ta(C2H4) to afford [N3N]Ta:CHMe, 1st, and then what probably is [N3N]Ta:AsSiMe3. [N3N]Ta(C2H4) reacts with dihydrogen to give [N3N]Ta(H)Et reversibly. [N3N]Ta(C6H4) reacts with ArNH2 (Ar = Ph, C6F5) to give [N3N]Ta:NAr complexes, but [N3N]Ta(C2H2) is relatively unreactive. X-ray structures of [N3N]Ta(Me)Et and [N3N]Ta(C2H2) are included.

CC 29-10 (Organometallic and Organometalloidal Compounds)

Section cross-reference(s): 22, 75

IT 766-90-5, cis-.beta.-**Methylstyrene** 873-66-5,

trans-.beta.-**Methylstyrene**

(formation from tantalum silyltrialamidoamine ethylidene complex and benzaldehyde)

IT 86728-83-8, Bis(.eta.5-**cyclopentadienyl**)iron(1+)
trifluoromethanesulfonate

(reaction with tantalum silyltrialamidoamine Me complex)

IT 151463-66-0

(reactions with **lithium amides**, organolithium
and Grignard reagents)

L32 ANSWER 6 OF 25 HCA COPYRIGHT 2004 ACS on STN

124:150075 **Manufacture of lithium amide** as

strong base in organic synthesis. Schwindeman, James A.; Morrison,
Robert C. (FMC Corp., USA). U.S. US 5486343 A 19960123, 3 pp.

(English). CODEN: USXXAM. APPLICATION: US 1994-232891 19940425.

AB **Lithium amide** is **prepd.** by forming lithium bronze by introducing .gtoreq.1 equiv of anhyd. **ammonia** over a 1-5 h into a dispersion contg. 1 equiv. of lithium in a liq. hydrocarbon **solvent** at .ltoreq.40.degree., heating the lithium bronze reaction mixt. at 50-80.degree. for 2-4 h to decomp. the lithium bronze and form a suspension of **lithium amide** in the **solvent**, and recovering the **lithium amide** from the suspension. The **lithium amide** is an useful agent in the org. synthesis as an inorg. base.

IT 7664-41-7, **Ammonia**, reactions
(anhyd.; in **manuf.** of **lithium amide**
as strong base in org. synthesis)

RN 7664-41-7 HCA

CN **Ammonia** (8CI, 9CI) (CA INDEX NAME)

NH₃

IT 7439-93-2, **Lithium**, reactions
(in **manuf.** of **lithium amide** as
strong base in org. synthesis)

RN 7439-93-2 HCA

CN **Lithium** (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7782-89-0P, **Lithium amide**
(**manuf.** of **lithium amide** as strong
base in org. synthesis)

RN 7782-89-0 HCA

CN **Lithium amide** (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IC ICM C01B021-00

NCL 423413000

CC 49-5 (Industrial Inorganic Chemicals)

ST **lithium amide** **manuf** anhyd
ammonia; hydrocarbon **solvent** **lithium**
amide **manuf**; org synthesis inorg base agent

IT 7664-41-7, **Ammonia**, reactions
(anhyd.; in **manuf.** of **lithium amide**
as strong base in org. synthesis)

IT 7439-93-2, **Lithium**, reactions

(in manuf. of lithium amide as
strong base in org. synthesis)

IT 7782-89-0P, Lithium amide

(manuf. of lithium amide as strong
base in org. synthesis)

IT 106-98-9, 1-Butene, uses 109-67-1, 1-Pentene 110-83-8,
Cyclohexene, uses 111-66-0, 1-Octene 115-07-1, 1-Propene, uses
142-29-0, Cyclopentene 592-41-6, 1-Hexene, uses 592-76-7,
1-Heptene 822-35-5, Cyclobutene 931-88-4, Cyclooctene
2781-85-3, Cyclopropene

(solvent; in manuf. of lithium
amide as strong base in org. synthesis)

L32 ANSWER 7 OF 25 HCA COPYRIGHT 2004 ACS on STN

109:99325 The xerogel made from decomposing liquid metal-**ammonia**
solutions - a solid material which carries current densities of 105
A cm⁻² at room temperature. Arendt, P. (Sekt. Chem.,
Humboldt-Univ., Berlin, Ger. Dem. Rep.). Journal of Physics and
Chemistry of Solids, 49(5), 511-17 (English) 1988. CODEN: JPCSAW.
ISSN: 0022-3697.

AB Decomp. liq. Li-NH₃ and Na-NH₃ solns. are
high-conducting in some crit. decompd. states, in which they form a
gel with capillaries of the non-decompd. soln. extending
one-dimensionally through a sponge-like network of the decompn.
product (alkali amide). The solns. may be stabilized at room temp.
in their crit. decompd. state if the **ammonia** is swept out
of the capillaries of the gel in order to inhibit any further
decompn. reaction. The xerogel, which retains the reduced
structural dimensionality of the gel, can carry current densities of
105 A cm⁻².

IT 7664-41-7, **Ammonia**, uses and miscellaneous
(decompn. of alkali metal solns. in, formation of xerogel with
one-dimensional cond. by)

RN 7664-41-7 HCA

CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

IT 7439-93-2, Lithium, properties
(decompn. of liq. **ammonia** soln. of, formation of
xerogel with one-dimensional elec. cond. by)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7782-89-0P
(formation of spongelike, by decompn. of lithium-
ammonia soln., elec. conductor from)
RN 7782-89-0 HCA
CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

CC 66-4 (Surface Chemistry and Colloids)
Section cross-reference(s): 67, 76
ST xerogel prepn alkali metal ammonia soln; lithium
ammonia decompn xerogel formation; sodium ammonia
decompn xerogel formation; decompn ammonia metal xerogel
formation; amide alkali spongelike formation; conductor xerogel
alkali metal ammonia
IT Gels
(xero-, from liq. alkali metal-ammonia soln. decompn.,
one-dimensional conductive)
IT 7664-41-7, Ammonia, uses and miscellaneous
(decompn. of alkali metal solns. in, formation of xerogel with
one-dimensional cond. by)
IT 7439-93-2, Lithium, properties 7440-23-5, Sodium,
properties
(decompn. of liq. ammonia soln. of, formation of
xerogel with one-dimensional elec. cond. by)
IT 7782-89-0P 7782-92-5P, Sodium amide
(formation of spongelike, by decompn. of lithium-
ammonia soln., elec. conductor from)

L32 ANSWER 8 OF 25 HCA COPYRIGHT 2004 ACS on STN
107:167596 Twisted tetrahedra chains .infin.1[Li(NH₂)_{4/2}-] in the
structure of the hexagonal modification of cesium lithium
amide, CsLi(NH₂)₂. Harbrecht, B.; Jacobs, H. (Fachbereich
Chem., Univ. Dortmund, Dortmund, D-4600/50, Fed. Rep. Ger.).
Zeitschrift fuer Anorganische und Allgemeine Chemie, 546, 48-54
(German) 1987. CODEN: ZAACAB. ISSN: 0044-2313.
AB CsLi(NH₂)₂ (dimorphous) and CsLi₂(NH₂)₃, were prepd. by reaction of
the metals with NH₃ in high pressure autoclaves. The
structure of the hexagonal modification of CsLi(NH₂)₂ was
established inclusive the H atom positions from single crystal x-ray
data. The compd. crystallizes in the space group P6₂22 with Z = 3,
a 6.331(1) and c 8.410(1) .ANG.. Li ions occupy distorted N
tetrahedra. These tetrahedra are connected by trans-located edges
along [001]. The Cs ions combine the equally oriented chains
1.infin.[Li(NH₂)_{4/2}-]. The amide ions are twisted out of the
hexagonal aa-plane. If sp³-hybridized valence electrons of the N
atoms are assumed, the bonding interaction between free electron

pairs and Li ions are thereby strengthened.

IT 7439-93-2, Lithium, reactions
(reaction of, with **ammonia** and cesium in autoclave)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7664-41-7, **Ammonia**, reactions
(reaction of, with cesium and lithium in autoclave)
RN 7664-41-7 HCA
CN **Ammonia** (8CI, 9CI) (CA INDEX NAME)

NH₃

CC 78-6 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75
ST crystal structure cesium **lithium amide**; cesium
lithium amide prepn structure
IT Crystal structure
(of cesium **lithium amides**)
IT 7439-93-2, Lithium, reactions
(reaction of, with **ammonia** and cesium in autoclave)
IT 7440-46-2, Cesium, reactions
(reaction of, with **ammonia** and lithium in autoclave)
IT 7664-41-7, **Ammonia**, reactions
(reaction of, with cesium and lithium in autoclave)

L32 ANSWER 9 OF 25 HCA COPYRIGHT 2004 ACS on STN
105:103561 The remarkably invariant interaction energies of lithium
first-row compounds with water and with **ammonia**.
Kaufmann, Elmar; Tidor, Bruce; Schleyer, Paul V. R. (Inst. Org.
Chem., Friedrich-Alexander-Univ., Erlangen, D-8520, Fed. Rep. Ger.).
Journal of Computational Chemistry, 7(3), 334-44 (English) 1986.
CODEN: JCCHDD. ISSN: 0192-8651.
AB Solvation energies of Li 1st-row compds. LiX (X = H, Li, BeH, BH₂,
CH₃, NH₂, OH, F) and of the Li cation with the model
solvents H₂O and **NH₃** were calcd. ab initio with
zero-point vibrational energy corrections. The solvation energies
are const.: -18.0 +/- 1.2 and -21.5 +/- 1.3 kcal/mol for the
hydrates and **NH₃** solvates, resp. This independence on the
nature of X is due largely to the ionic character of the LiX compds.
(dipole moments 4.7-6.6 Debye). The unexpectedly high solvation
energies of the Li mol. (-14.3 and -17.8 kcal/mol, resp.) are due to
the polarizability of Li². At the same level, the Li cation has
interaction energies with H₂O and **NH₃** of -34.1 and -39.7

kcal/mol, resp. For the hydrates of LiOH and LiF cyclic structures with H bonds and somewhat increased solvation energies also are described.

IT 7664-41-7, properties
(solvation energy in, of lithium 1st-row compds.)
RN 7664-41-7 HCA
CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

IT 7782-89-0
(solvation energy of, in ammonia or water)
RN 7782-89-0 HCA
CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IT 7439-93-2, properties
(solvation energy of, in water or ammonia)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 68-6 (Phase Equilibriums, Chemical Equilibriums, and Solutions) .
Section cross-reference(s): 65
ST lithium compd solvation energy; hydration energy lithium first row
compd; ammonia solvate lithium first row compd
IT Heat of solvation
(of lithium 1st-row compds., by ammonia, calcn. of)
IT 7664-41-7, properties
(solvation energy in, of lithium 1st-row compds.)
IT 917-54-4 1310-65-2 7580-67-8 7782-89-0 7789-24-4,
properties 14452-59-6, properties 64360-73-2 64360-74-3
(solvation energy of, in ammonia or water)
IT 7439-93-2, properties
(solvation energy of, in water or ammonia)

L32 ANSWER 10 OF 25 HCA COPYRIGHT 2004 ACS on STN
104:217978 Lithium aluminum amide, LiAl(NH₂)₄ - preparation, x-ray
study, IR spectrum, and thermal decomposition. Jacobs, H.;
Jaenichen, K.; Hadenfeldt, C.; Juza, R. (Fachbereich Chem., Univ.
Dortmund, Dortmund, D-4600, Fed. Rep. Ger.). Zeitschrift fuer
Anorganische und Allgemeine Chemie, 531, 125-39 (German) 1985.
CODEN: ZAACAB. ISSN: 0044-2313.

AB The reaction of Li and Al with liq. **NH3** gives $\text{LiAl}(\text{NH}_2)_4$ within some days at 80-100.degree.. Crystals for an x-ray structure detn. must be grown very slowly from liq. **NH3** starting with thoroughly pulverized amide. The structure anal. was successful including the detn. of the positions of the H atoms of the amide ions. Crystals are monoclinic, space group P21/n with a 9.478(1), b 7.351(1), c 7.398(1) .ANG., .beta. 90.26(1).degree.; Z = 4, R-values (unweighted, weighted with w = 1) 0.042/0.046. The at. arrangement of $\text{LiAl}(\text{NH}_2)_4$ can formally be described as a new variant of the GaPS4-type structure. The compd. was also characterized by its IR spectrum. The thermal degrdn. of $\text{LiAl}(\text{NH}_2)_4$ gives at 180.degree. amorphous $\text{Al}_2(\text{NH})_3$ and cryst. **LiNH2**; at 220.degree. very fine AlN results. Above 400.degree. this AlN reacts with **LiNH2** or Li_2NH forming Li_3AlN_2 .

IT 7782-89-0P

(formation of, in thermal decompn. of lithium amidoaluminate)

RN 7782-89-0 HCA

CN Lithium amide ($\text{Li}(\text{NH}_2)$) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IT 7664-41-7, reactions

(reaction of liq., with aluminum and lithium, lithium tetraamidoaluminate from)

RN 7664-41-7 HCA

CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

IT 7439-93-2, reactions

(reaction of, with aluminum and liq. ammonia, lithium tetraamidoaluminate from)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 78-6 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 75

IT 7782-89-0P 24304-00-5P 61027-73-4P 102401-99-0P

(formation of, in thermal decompn. of lithium amidoaluminate)

IT 7664-41-7, reactions

(reaction of liq., with aluminum and lithium, lithium

- tetraamidoaluminate from)
- IT 7439-93-2, reactions
(reaction of, with aluminum and liq. ammonia, lithium tetraamidoaluminate from)
- IT 7429-90-5, reactions
(reaction of, with lithium and liq. ammonia, lithium tetraamidoaluminate from)
- L32 ANSWER 11 OF 25 HCA COPYRIGHT 2004 ACS on STN
103:5900 7-Acetoxyhept-2-yn-1-ol. Theil, Fritz; Schick, Hans; Schwarz, Sigfrid (Akademie der Wissenschaften der DDR, Ger. Dem. Rep.). Ger. (East) DD 214374 A1 19841010, 5 pp. (German). CODEN: GEXXA8.
APPLICATION: DD 1983-249436 19830404.
- AB 2-Propyn-1-ol was alkylated with Br(CH₂)₄Cl in the presence of LiNH₂ to give 7-chloro-2-heptyn-1-ol which reacted with KOAc in polyethylene glycol 400 to give 7-acetoxy-2-heptyn-1-ol, an important intermediate for prostaglandins or prostaglandin-like compds. Treating NH₃(l) with Li gave a soln. of LiNH₂ which was treated with 2-propyn-1-ol and stirred 30 min at -40 to -33.degree.. This soln. was then treated with Br(CH₂)₄Cl to give 76% HOCH₂C.tplbond.C(CH₂)₄Cl which was added to KOAc in polyethylene glycol 400 and the mixt. stirred 8 h at 110.degree. to give 80% HOCH₂C.tplbond.C(CH₂)₄OAc.
- IT 7782-89-0P
(prepn. and metalation by, of propynol)
- RN 7782-89-0 HCA
- CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

- IT 7439-93-2, reactions
(reaction of, with ammonia)
- RN 7439-93-2 HCA
- CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

- IT 7664-41-7, reactions
(reaction of, with lithium)
- RN 7664-41-7 HCA
- CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

- IC C07C069-16

CC 23-17 (Aliphatic Compounds)
Section cross-reference(s): 26

IT 7782-89-0P
(prepn. and metalation by, of propynol)

IT 7439-93-2, reactions
(reaction of, with ammonia)

IT 7664-41-7, reactions
(reaction of, with lithium)

L32 ANSWER 12 OF 25 HCA COPYRIGHT 2004 ACS on STN
101:179594 Improved procedure for calculating the collision stopping power of elements and compounds for electrons and positrons. Seltzer, Stephen M.; Berger, Martin J. (Natl. Bur. Stand., Washington, DC, 20234, USA). International Journal of Applied Radiation and Isotopes, 35(7), 665-76 (English) 1984. CODEN: IJARAY. ISSN: 0020-708X.

AB An addendum is provided to an earlier paper which described a procedure and provided the data base for the quick-and-easy calcn. of e and e+ collision stopping powers. The procedure makes use of Bethe's stopping-power formula and R.M. Sternheimer's (1967) theory of the d. effect, and involves a parametrization such that some parameters depend only on the particle energy and all others on the properties of the stopping material; by using the data provided, the stopping powers can easily be evaluated with a hand-held scientific calculator. The data base of 278 materials was updated through an improved evaluation of the d. effect within the framework of Sternheimer's theory. The use of the new instead of the old data base can result in stopping-power changes as large as 1-2%.

IT 7439-93-2, properties 7664-41-7, properties
7782-89-0 25013-15-4
(electron and positron collision stopping power of)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7664-41-7 HCA

CN Ammonia (8CI, 9CI) (CA INDEX NAME)

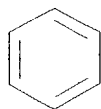
NH₃

RN 7782-89-0 HCA

CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

RN 25013-15-4 HCA
 CN Benzene, ethenylmethyl- (9CI) (CA INDEX NAME)



D1-Me

D1-CH=CH₂

CC 71-9 (Nuclear Technology)

IT Elements

Glass, oxide

Glass, oxide

Organic compounds, properties

Rubber, **butadiene**, properties

Rubber, natural, properties

Rubber, neoprene, properties

(electron and positron collision stopping power in)

IT 50-99-7, properties 56-23-5, properties 56-41-7, properties
 56-81-5, properties 56-85-9, properties 57-13-6, properties
 57-50-1, properties 60-29-7, properties 62-53-3, properties
 64-17-5, properties 67-56-1, properties 67-64-1, properties
 67-66-3, properties 67-68-5, properties 68-12-2, properties
 71-23-8, properties 71-36-3, properties 71-43-2, properties
 72-18-4, properties 73-24-5, properties 73-40-5 74-82-8,
 properties 74-84-0, properties 74-85-1, properties 74-86-2,
 properties 74-98-6, properties 75-61-6 75-63-8 75-71-8
 75-72-9 78-40-0 79-01-6, properties 91-20-3, properties
 95-50-1 98-95-3, properties 106-97-8, properties 107-06-2,
 properties 108-88-3, properties 108-90-7, properties 109-66-0,
 properties 110-54-3, properties 110-82-7, properties 110-86-1,
 properties 111-65-9, properties 120-12-7, properties 124-38-9,
 properties 127-18-4, properties 142-82-5, properties 471-34-1,
 properties 497-19-8, properties 546-93-0 554-13-2 588-59-0
 1303-00-0, properties 1303-86-2, properties 1304-56-9
 1305-78-8, properties 1306-25-8, properties 1309-37-1,
 properties 1309-48-4, properties 1330-20-7, properties
 1333-74-0, properties 1335-25-7 1344-28-1, properties
 1345-25-1, properties 2314-97-8 7429-90-5, properties
 7429-91-6, properties 7439-88-5, properties 7439-89-6,

properties 7439-90-9, properties 7439-91-0, properties
7439-92-1, properties **7439-93-2**, properties 7439-94-3,
analysis 7439-95-4, properties 7439-96-5, properties
7439-97-6, properties 7439-98-7, properties 7439-99-8,
properties 7440-00-8, properties 7440-01-9, properties
7440-02-0, properties 7440-03-1, properties 7440-04-2,
properties 7440-05-3, properties 7440-06-4, properties
7440-07-5, properties 7440-08-6, properties 7440-09-7,
properties 7440-10-0, properties 7440-12-2, properties
7440-13-3, properties 7440-14-4, properties 7440-15-5,
properties 7440-16-6, properties 7440-17-7, properties
7440-18-8, properties 7440-19-9, properties 7440-20-2,
properties 7440-21-3, properties 7440-22-4, properties
7440-23-5, properties 7440-24-6, properties 7440-25-7,
properties 7440-26-8, properties 7440-27-9, properties
7440-28-0, properties 7440-29-1, properties 7440-30-4, analysis
7440-31-5, properties 7440-32-6, properties 7440-33-7,
properties 7440-34-8, properties 7440-35-9, properties
7440-36-0, properties 7440-37-1, properties 7440-38-2,
properties 7440-39-3, properties 7440-40-6, properties
7440-41-7, properties 7440-42-8, properties 7440-43-9,
properties 7440-45-1, properties 7440-46-2, properties
7440-47-3, properties 7440-48-4, properties 7440-50-8,
properties 7440-51-9, properties 7440-52-0, properties
7440-53-1, properties 7440-54-2, properties 7440-55-3,
properties 7440-56-4, properties 7440-57-5, properties
7440-58-6, properties 7440-59-7, properties 7440-60-0,
properties 7440-61-1, properties 7440-62-2, properties
7440-63-3, properties 7440-64-4, analysis 7440-65-5, properties
7440-66-6, properties 7440-67-7, properties 7440-69-9,
properties 7440-70-2, properties 7440-74-6, properties
7553-56-2, properties 7580-67-8 7631-86-9, properties
7631-99-4, properties **7664-41-7**, properties 7681-11-0,
properties 7681-82-5, properties 7704-34-9, properties
7720-78-7 7723-14-0, properties 7726-95-6, properties
7727-37-9, properties 7727-43-7 7732-18-5, vapor 7774-29-0
7778-18-9 7782-41-4, properties 7782-42-5, properties
7782-44-7, properties 7782-49-2, properties 7782-50-5,
properties **7782-89-0** 7783-40-6 7783-82-6 7783-90-6,
properties 7783-96-2 7785-23-1 7787-32-8 7789-17-5
7789-24-4, properties 7789-75-5, properties 7790-75-2
9002-81-7 9002-83-9 9002-84-0 9002-85-1 9002-86-2
9002-88-4 9002-89-5 9003-07-0 9003-20-7 9003-39-8
9003-53-6 9004-36-8 9004-57-3 9004-70-0 9008-66-6
9011-14-7 9012-45-7 9022-52-0 10024-97-2, properties
10043-92-2, properties 10377-51-2 11113-93-2 12007-60-2
12007-62-4 12057-24-8, properties 12059-95-9 12069-32-8
12070-09-6 12071-33-9 12136-45-7, properties 12233-56-6

12401-86-4 13400-13-0 13463-67-7, properties 13494-80-9,
 properties 13590-82-4 13875-40-6 24936-68-3, properties
 24937-79-9 **25013-15-4** 25014-41-9 25035-04-5
 25036-53-7 25038-54-4, properties 25038-59-9, properties
 26140-60-3 26499-65-0 27753-54-4 32131-17-2, properties
 37265-36-4 39321-10-3 39377-61-2 39383-96-5 53095-20-8
 56802-53-0 81209-21-4 90577-10-9 90651-04-0 90651-48-2
 90651-60-8 90669-41-3

(electron and positron collision stopping power of)

L32 ANSWER 13 OF 25 HCA COPYRIGHT 2004 ACS on STN

101:13716 Density effect for the ionization loss of charged particles in various substances. Sternheimer, R. M.; Berger, M. J.; Seltzer, S. M. (Dep. Phys., Brookhaven Natl. Lab., Upton, NY, 11973, USA). Atomic Data and Nuclear Data Tables, 30(2), 261-71 (English) 1984. CODEN: ADNDAT. ISSN: 0092-640X.

AB The d.-effect correction $\Delta(\beta)$ for the ionization energy loss of charged particles was evaluated as a function of the particle velocity for a total of 278 substances, including 98 cases of elements of the periodic table (12 gases and 86 condensed materials, including liq. H and graphite of 3-different densities) and 180 chem. compds. and substances of biol. interest (13 gases and 167 liq. or solid substances). In the calcns., up-to-date values of the mean excitation potential I and of the at. absorption edges $h\nu_i$ were employed as input data for the general equations for $\Delta(\beta)$ previously derived by R. M. Sternheimer.

IT **7439-93-2**, properties **7664-41-7**, properties
7782-89-0 **25013-15-4**

(d. effect for ionization loss of charged particles in)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

RN 7664-41-7 HCA

CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

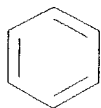
RN 7782-89-0 HCA

CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

RN 25013-15-4 HCA

CN Benzene, ethenylmethyl- (9CI) (CA INDEX NAME)



D1—Me

D1—CH=CH₂

CC 71-9 (Nuclear Technology)

IT 50-99-7, properties 56-23-5, properties 56-41-7, properties
 56-81-5, properties 56-85-9, properties 57-50-1, properties
 60-29-7, properties 62-53-3, properties 64-17-5, properties
 67-56-1, properties 67-64-1, properties 67-66-3, properties
 67-68-5, properties 68-12-2, properties 71-23-8, properties
 71-36-3, properties 71-43-2, properties 73-24-5, properties
 73-40-5 74-82-8, properties 74-84-0, properties 74-85-1,
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25013-15-4 25014-41-9 25036-53-7 25038-59-9,
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 39321-10-3 39377-61-2 39383-96-5 53095-20-8 56802-53-0
 90577-10-9 90651-48-2 90651-60-8 90669-41-3

(d. effect for ionization loss of charged particles in)

L32 ANSWER 14 OF 25 HCA COPYRIGHT 2004 ACS on STN
 98:26733 Trilithium sodium amide ($\text{Li}_3\text{Na}(\text{NH}_2)_4$), a compound with a
 structure related to **lithium amide**. Jacobs, H.;

Harbrecht, B. (Inst. Anorg. Chem., Rheinisch-Westfael. Tech. Hochsch. Aachen, Aachen, D-5100, Fed. Rep. Ger.). Journal of the Less-Common Metals, 85(1), 87-95 (German) 1982. CODEN: JCOMAH. ISSN: 0022-5088.

AB In the **LiNH₂**-NaNH₂ system, 3 ternary amides were detd. by x-ray investigation: **LiNa₂(NH₂)₃**, **Li₃Na(NH₂)₄** and **Li₅Na(NH₂)₆**. The compds. were obtained by the reaction with supercrit. **NH₃** of the **metals Li** and Na in molar ratios from 1:3 to 3:1. The at. arrangement is given for **Li₃Na(NH₂)₄** at 180 and 293 K from single-crystal data.

IT 7782-89-0

(system, sodium amide-, ternary amide formation in)

RN 7782-89-0 HCA

CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

CC 78-5 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75

IT 7782-92-5

(system, **lithium amide**-, ternary amide
formation in)

IT 7782-89-0

(system, sodium amide-, ternary amide formation in)

L32 ANSWER 15 OF 25 HCA COPYRIGHT 2004 ACS on STN
93:97832 **Lithium amide**. Bach, Ricardo O.; Morrison,
Robert C. (Lithium Corp. of America, USA). U.S. US 4206191
19800603, 7 pp. Cont.-in-part of U.S. Ser. No. 877,122, abandoned.
(English). CODEN: USXXAM. APPLICATION: US 1978-970531 19781218.

AB Finely divided **LiNH₂** is **manufd.** by a low-temp.
method. A mixt. is 1st formed of bulk pieces of **Li**
metal with a catalyst such as active metallic Co in an inert
liq. arom. hydrocarbon, such as toluene, at 0 to -60.degree..
Anhyd. liq. **NH₃** is then added, aided by stirring, the
Li metal dissolving, 2 immiscible phases forming,
one a so-called Li-NH₃ bronze soln. being the top phase,
and the toluene being the bottom phase. The **formation** of
the **LiNH₂** is then affected by raising the temp. under
conditions of stirring, H₂ and excess **NH₃** being liberated
and the **LiNH₂**, generally light gray in color, is formed
which separates out in a very finely divided solid state, as a
slurry in the toluene, and is recovered.

IT 7782-89-0P

(**manuf.** of)

RN 7782-89-0 HCA

CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IT 7439-93-2, reactions
(reaction of, with ammonia, cobalt catalyst in)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7664-41-7, reactions
(reaction of, with lithium, cobalt catalyst in)
RN 7664-41-7 HCA
CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

IC C01D015-00
NCL 423413000
CC 49-5 (Industrial Inorganic Chemicals)
ST lithium amide manuf; ammonia
lithium reaction
IT Catalysts and Catalysis
(cobalt, for ammonia reaction with lithium)
IT 7440-48-4, uses and miscellaneous
(catalyst, for ammonia reaction with lithium)
IT 7782-89-0P
(manuf. of)
IT 7439-93-2, reactions
(reaction of, with ammonia, cobalt catalyst in)
IT 7664-41-7, reactions
(reaction of, with lithium, cobalt catalyst in)

L32 ANSWER 16 OF 25 HCA COPYRIGHT 2004 ACS on STN
91:159820 Lithium amide. Bazyl'chik, V. V.;
Fedorov, P. I. (Chuvash State University, USSR). U.S.S.R. SU 674976
19790725 From: Otkrytiya, Izobret., Prom. Obraztsy, Tovarnye Znaki
1979, (27), 64. (Russian). CODEN: URXXAF. APPLICATION: SU
1976-2428626 19761213.

AB LiNH₂ is obtained by reacting metallic
Li with dry NH₃ gas and then treating it with an
inert solvent at elevated temp. in the presence of a
trivalent iron compd. catalyst. The purity of the LiNH₂
and its catalytic activity are increased by using n-hexane as the
inert solvent and treating at 65-70.degree. with the

Li:n-hexane ratio 1:(10-20).

IT 7782-89-0P
(manuf. of)
RN 7782-89-0 HCA
CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IT 7439-93-2, reactions
(reaction of, with ammonia, ferric salt catalysts for)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7664-41-7, reactions
(reaction of, with lithium, ferric salt catalysts for)
RN 7664-41-7 HCA
CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

IC C01B021-10; C01D015-00
CC 49-10 (Industrial Inorganic Chemicals)
ST lithium amide manuf; ammonia
lithium reaction catalyst; ferric salt catalyst
IT 7439-89-6D, salts
(catalysts, for lithium amide)
IT 7782-89-0P
(manuf. of)
IT 7439-93-2, reactions
(reaction of, with ammonia, ferric salt catalysts for)
IT 7664-41-7, reactions
(reaction of, with lithium, ferric salt catalysts for)

L32 ANSWER 17 OF 25 HCA COPYRIGHT 2004 ACS on STN

65:38204 Original Reference No. 65:7075f-h **Cyclohexadienes.**
(Shell Internationale Research Maatschappij NV). NL 6513444
19660420, 6 pp. (Unavailable). PRIORITY: US 19641019.

AB The title compds. are prepd. by partial redn. of benzene and (or)
homologs thereof in liquid NH₃ and in the presence of Li
at 10-135.degree. (preferably 25-60.degree.) and at pressures
between 2 and 300 atm. The reaction is carried out in the absence
or near-absence of hydrolytically active compds. Li is regenerated
from LiNH₂ by means of pyrolysis. The ratio NH₃

-aromatic component is between 10:1 and 50:1. The reaction mixt. contains 1-8 Li atoms/mol. aromatic component. The title compds. are used as chem. intermediates and in particular as monomers for the prepn. of copolymers and also as starting material for the prepn. of mono- and diepoxides used in the epoxy resin preps. A no. of expts. was carried out in which benzene was treated with Li in **NH3**; 0.10 mole benzene, 2.4-2.7 moles liquid **NH3**, and different amts. of Li were passed into a reactor. The reactor was heated and cooled and the mixt. was freed from org. compds. and **NH3** by distn. The following results are given in the table. A mixt. of 0.1 mole toluene, 0.4 mole Li and 2.6 moles **NH3** gave after reaction and heating for 4 hrs. at 60.degree., 3.7% methylcyclohexene and 20.1% **methylcyclohexadiene** (calcd. on toluene). Li, g. atom, Temp..degree. C, Time, hrs., % Yield product (calcd. on C6H6), Cyclohexane, Cyclohexene, 1,4-Cyclohexadiene; 0.1, 53, 2.5, 0, 2.6, 7.4; 0.2, 60, 2, traces, 5.1, 30.7; 0.4, 25, 12, 0.5, 4.4, 39.6; 0.4, 60, 2, 0, 5.2, 41.6; 0.8, 60, 8, 0, 42.2, 54.5; 0.4, 100, 0.5, 0.2, 19.1, 34.8;

IT 7439-93-2, Lithium
(benzene hydrocarbon hydrogenation (selective) by, in liquid **NH3**)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7664-41-7, Ammonia
(lithium solns. in liquid, benzene hydrocarbon hydrogenation (selective) by)
RN 7664-41-7 HCA
CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH3

IC C07C
CC 34 (Alicyclic Compounds)
IT Hydrogenation
(of benzene derivs., by Li in liquid **NH3**, selective)
IT 7439-93-2, Lithium
(benzene hydrocarbon hydrogenation (selective) by, in liquid **NH3**)
IT 71-43-2, Benzene
(derivatives, hydrogenation of alkyl, by Li in liquid **NH3**)
IT 71-43-2, Benzene

- (hydrogenation (selective) of, by Li in liquid **NH3**)
- IT 7664-41-7, **Ammonia**
(lithium solns. in liquid, benzene hydrocarbon hydrogenation
(selective) by)
- IT 628-41-1, 1,4-**Cyclohexadiene**
(manuf. by C6H6 hydrogenation by Li in liquid **NH3**)
- L32 ANSWER 18 OF 25 HCA COPYRIGHT 2004 ACS on STN
55:112261 Original Reference No. 55:21170i,21171a-d Modified Birch
reduction of 17.alpha.-ethynylestradiol 3-methyl ether.
(Ormonoterapia Richter Societa per Azioni). GB 863400 19610322
(Unavailable). APPLICATION: GB .
- AB The reaction of 3-methoxy-13-methyl - 17.alpha.-ethynyl-
6,7,8,9,11,12,13,14,16,17-decahydro-15H-cyclopenta[a]phenanthren-
17.beta.-ol (I) with Na, K, or Li in liquid **NH3** and EtOH
after reaction with NaNH2, KNH2, or **LiNH2** was described.
The usual Birch redn. of I yielded some 3-methoxyestra-2,5(10)-
diene in addn. to 3-methoxy- 13- methyl-17-vinyl-
1,4,6,7,8,9,11,12,13,14,16,17-dodecahydro-15H-cyclopenta [a]
phenanthren-17.beta.-ol (Colton, et al., CA 51, 9659i). The
reaction with excess alkali metal amide replaced the active
hydrogens in I with alkali metal, and thus avoided hydrogenolysis in
the redn. step. Thus, Li 0.125 was added in small pieces to liquid
NH3 100 parts in the presence of one crystal of Fe(NO3)3.
After the blue color disappeared I 1 in anhyd. Et2O 50 parts was
added during 30 min. and the mixt. stirred 90 min. Li 1 part was
added in small pieces during 20 min. and the mixt. stirred 30 min.
Abs. EtOH was added during 20 min., and the **NH3** evapd.
After diln. with H2O, the residue was extd. with Et2O, the ext.
washed with H2O, dried over Na2SO4, and the Et2O evapd. A soln. of
the residue in MeOH 90 was treated 40 min. at 25.degree. with
(HO2C)2.2H2O 1.3 in H2O 16.5 parts. The soln. was dild. with H2O,
extd. with Et2O, and the Et2O ext. washed with NaHCO3 soln. and with
H2O. After drying the ext. was evapd., and the residue crystd. from
Et2O-hexane to yield 13-methyl-17.alpha.-vinyl-17.beta.-hydroxy-
1,2,3,4,6,7,8,9,11,12,13,14,16,17-tetradecahydro -
15H-cyclopenta[a]phenanthren-3-one 0.8 part, m. 142-3.degree.,
[.alpha.]D 161.degree. (CHCl3). When the acid hydrolysis was done
in MeOH 40 with 3N HCl 20 parts and the temp. lowered from the b.p.
to 20.degree. in about 45 min., the product, isolated by concn. of
the dried Et2O ext., was 13-methyl-17.alpha.-vinyl-17.beta.-hydroxy
- 1,2,3,6,7,8,9,10,11,12,13,14,16,17-tetradecahydro-15H-
cyclopenta[a]phenanthrene-3-on, m. 164-6.degree., [.alpha.]D
27.degree. (CHCl3).
- IT 7664-41-7, **Ammonia**
(liquid, 3-methoxy-19-nor-17.alpha.-pregna-1,3,5(10)-trien-20-yn-
17-ol stereoisomer reaction with Li in)
- RN 7664-41-7 HCA

CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

IT 7439-93-2, Lithium
(reactions of, with 3-methoxy-19-nor-17.alpha.-pregna-1,3,5(10)-
trien-20-yn-17-ol stereoisomer in liquid **NH₃**)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 10J (Organic Chemistry: Steroids)

IT 7664-41-7, Ammonia
(liquid, 3-methoxy-19-nor-17.alpha.-pregna-1,3,5(10)-trien-20-yn-
17-ol stereoisomer reaction with Li in)

IT 7439-93-2, Lithium
(reactions of, with 3-methoxy-19-nor-17.alpha.-pregna-1,3,5(10)-
trien-20-yn-17-ol stereoisomer in liquid **NH₃**)

L32 ANSWER 19 OF 25 HCA COPYRIGHT 2004 ACS on STN

55:51623 Original Reference No. 55:9938d-e Polymerization of
methacrylonitrile with Li. Overberger, C. G.; Pearce, Eli M.;
Mayes, N. (Polytech. Inst. of Brooklyn, Brooklyn, NY). Journal of
Polymer Science, 31, 217-18 (Unavailable) 1960. CODEN: JPSCAU.
ISSN: 0022-3832.

AB cf. CA 53, 6675e. The kinetics of the polymerization of
methacrylonitrile with Li in liq. **NH₃** at -75.degree. were
detd. The mechanism suggested for Li initiation is a 1 electron
transfer from Li to monomer to give an ion radical and all chain
growth of monomer is completed before relatively slow termination
with **NH₃** to give **LiNH₂**.

IT 7439-93-2, Lithium
(catalysts, in polymerization of methacrylonitrile in liquid
NH₃)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7782-89-0, Lithium amide
(**formation** in methacrylonitrile polymerization in
liquid **NH₃** with Li catalysts, termination by)

RN 7782-89-0 HCA

CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IT 7664-41-7, Ammonia
(liquid, methacrylonitrile polymerization in, with Li catalyst)
RN 7664-41-7 HCA
CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

CC 31 (Synthetic Resins and Plastics)
IT Catalysts
(in polymerization, of methacrylonitrile in liquid NH₃,
Li as)
IT Polymerization
(of methacrylonitrile, in liquid NH₃, Li as catalyst
in)
IT Reaction kinetics and(or) velocity
(of polymerization, of methacrylonitrile in liquid NH₃
by Li catalysts)
IT 7439-93-2, Lithium
(catalysts, in polymerization of methacrylonitrile in liquid
NH₃)
IT 7782-89-0, Lithium amide
(formation in methacrylonitrile polymerization in
liquid NH₃ with Li catalysts, termination by)
IT 7664-41-7, Ammonia
(liquid, methacrylonitrile polymerization in, with Li catalyst)
IT 126-98-7, Methacrylonitrile
(polymerization of, in liquid NH₃ with Li catalysts)

L32 ANSWER 20 OF 25 HCA COPYRIGHT 2004 ACS on STN
55:35490 Original Reference No. 55:6922h-i,6923a Polymerization of
esters of acrylic or methacrylic acids. Fettes, Robert C. (Rohm &
Haas Co.). US 2956990 19601018 (Unavailable). APPLICATION: US .
AB Polymers with a controlled mol. wt. of 90,000-1,000,000 are formed
by polymerizing an ester of acrylic or methacrylic acid with an
aliphatic, alicyclic, or aromatic alc. in the presence of a mixt. of
Na or K with Li, Ca, Sr, or Ba in the form of their salts of a Lewis
acid. By adjusting the ratio of the catalyst components, the mol.
sizes of the products can be varied. The reaction takes place in an
inert solvent under anhyd. conditions between -30.degree.
and -70.degree.. Thus, 0.633 g. Na and 0.545 g. Li (mole ratio
0.35:1) were introduced into a completely dry and O-free vessel.
Anhyd. NH₃ (1.5 l.) was condensed into the vessel, which
had been cooled at -78.degree.. With stirring, 5 ml. Me isobutyrate

and 218 g. Me methacrylate were added. Stirring was continued for 1.5 hr., and 8 g. NH_4Cl was then added to neutralize the unused initiator. After filtering, washing, and drying, a white, fluffy powder was recovered, having a mol. wt. of 150,000.

IT 7439-93-2, Lithium
(catalysts from NH_3 , K or Na and, in polymerization of acrylates and methacrylates)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7782-89-0, Lithium amide
(catalysts from Na amide and, in polymerization of acrylates and methacrylates)
RN 7782-89-0 HCA
CN Lithium amide ($\text{Li}(\text{NH}_2)$) (7CI, 8CI, 9CI) (CA INDEX NAME)

$\text{Li}-\text{NH}_2$

IT 7664-41-7, Ammonia
(liquid, catalysts from Li, Na and, in polymerization of acrylates and methacrylates)
RN 7664-41-7 HCA
CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH_3

CC 31 (Synthetic Resins and Plastics)
IT Catalysts
(for polymerization, of acrylic and methacrylic esters, Na or K and Ba, Ca, Li or Sc in liquid NH_3)
IT 7782-92-5, Sodium amide
(catalysts from Li amide and, in polymerization of acrylate and methacrylate)
IT 7439-93-2, Lithium
(catalysts from NH_3 , K or Na and, in polymerization of acrylates and methacrylates)
IT 7440-23-5, Sodium
(catalysts from NH_3 , Li and, in polymerization of acrylic and methacrylic esters)
IT 7440-24-6, Strontium 7440-39-3, Barium 7440-70-2, Calcium
(catalysts from NH_3 , Na or K and, in polymerization of acrylates or methacrylates)
IT 7782-89-0, Lithium amide

(catalysts from Na amide and, in polymerization of acrylates and methacrylates)

- IT 79-41-4, Methacrylic acid
(ester polymerization, catalysts for, from Na or K and Ba, Ca, Li or Sr in liquid **NH3**)
- IT 7664-41-7, Ammonia
(liquid, catalysts from Li, Na and, in polymerization of acrylates and methacrylates)

L32 ANSWER 21 OF 25 HCA COPYRIGHT 2004 ACS on STN

- 55:18091 Original Reference No. 55:3646f-i,3647a-c Acetylenic compounds. XIII. Reaction of acetylenic compounds with carbonyl groups and its orientation. I. Reaction of alkyl lithium with .alpha.-oxo esters and optical resolution of dl-2-ethynyl-2-phenylglycolic acid. Iwai, Issei; Yura, Yasuo (Sankyo Co., Tokyo). Yakugaku Zasshi, 80, 1193-8 (Unavailable) 1960. CODEN: YKKZAJ. ISSN: 0031-6903.
- AB cf. CA 54, 18487h. (-)-Menthyl phenylglyoxylate (I) b0.03 135-40.degree., [.alpha.]25D -42.degree.. (+)-Bornyl phenylglyoxylate (II) b0.03 120-1.degree., [.alpha.]25D 12.3.degree.. MeCOCOCl (from 25 g. MeCOCO2H and 67.6 g. SOCl2 in 22.5 g. C5H5N and 480 ml. Et2O) and 31 g. (-)-menthol in 27 ml. C5H5N and 67 ml. C6H6 at 0.degree. kept overnight and the C5H6 layer concd. gave 6.9 g. (-)-menthyl pyruvate (III), b3.5 105.degree., [.alpha.]25D -80.8.degree.. Similarly was prepd. (+)-bornyl pyruvate (IV), b1 93.degree., [.alpha.]25D 28.2.degree.. Cyclolaudenol (5 g.) in 25 ml. C6H6 and 2 ml. C5H5N treated with 7.75 g. PhCOCOCl, the mixt. kept overnight, H2O added, and the C6H6 layer concd. gave 2.4 g. cyclolaudenyl phenylglyoxylate (V), m. 182-2.5.degree., [.alpha.]20D 20.6.degree.. I (0.01 mole) in 30 ml. tetrahydrofuran and LiC.tplbond.CH (from 30 ml. liquid **NH3** and 0.14 g. atom Li) at -40.degree. stirred 10 hrs., stirred 30 min. with 1 g. NH4Cl, the **solvent** removed in vacuo, the residue extd. with Et2O, the Et2O removed, the residue in 27 ml. MeOH and 7 ml. 23% KOH refluxed 5 hrs. in N, the MeOH removed in vacuo, the alk. layer washed with Et2O, neutralized with 10% H2SO4, and the product extd. with Et2O gave 0.77 g. 2-ethynyl-2-phenylglycolic acid (VI), .alpha.25D -0.170.degree.. Similarly, II yielded 55.7% VI, .alpha.25D 0.108.degree.. LiNH2 [from 40 ml. liquid **NH3** and 0.14 g. Li with a small amt. of Fe(NO3)3] and 2.04 g. PhC.tplbond.CH in 40 ml. tetrahydrofuran stirred 30 min., stirred 10 hrs. with 0.01 mole I at -40.degree., decompd. with 1 g. NH4Cl, the **solvent** removed, the residue extd. with Et2O, and the product treated as above gave 0.902 g. 2-phenyl-(2-phenylethynyl)glycolic acid (VII), .alpha.25D -0.084.degree.. Similarly, II yielded 18.9% VII, .alpha.25D 0.380.degree.. Catalytic redn. of VI (from I) in EtOH gave 52.2% EtPhC(OH)CO2H (VIII), .alpha.25D -0.236.degree.. Similarly, VI (from II) gave 43%

VIII, $[\alpha]_D^{25}$ 0.108.degree.; VII (from I) gave 24.6% $\text{Ph}_2\text{C}(\text{OH})\text{CO}_2\text{H}$ (IX), $[\alpha]_D^{25}$ -0.063.degree.; VII (from II) gave 20.2% IX, $[\alpha]_D^{25}$ 0.529.degree.. $\text{PhCH}_2\text{CH}_2\text{MgBr}$ (3.7 g. $\text{PhCH}_2\text{CH}_2\text{Br}$, 0.28 g. Mg, and 12 ml. Et_2O) treated with 1 g. I in 12 ml. Et_2O , the mixt. stirred 1 hr., refluxed 30 min., the product decompd. with aq. NH_4Cl soln., and extd. with Et_2O gave crude ester; this in 5 ml. MeOH, 0.3 g. KOH, and 1 ml. H_2O refluxed 5 hrs., the soln. washed with Et_2O , acidified with HCl, and the product extd. with Et_2O gave 0.445 g. $\text{Ph}(\text{PhCH}_2\text{CH}_2)\text{C}(\text{OH})\text{CO}_2\text{H}$ (X), $[\alpha]_D^{25}$ -0.080.degree.. Similarly, II yielded 52% X, $[\alpha]_D^{25}$ 0.075.degree.. LiC.tplbond.CH (from 0.257 g. Li) and 4.15 g. III in 50 ml. tetrahydrofuran at -40.degree. stirred 10 hrs., the product decompd. with NH_4Cl , the solvent removed, the residue in EtOH reduced with PtO_2 and H, the EtOH removed, the residue in 40 ml. MeOH, 8 ml. H_2O , and 2.3 g. KOH refluxed 5 hrs., the soln. washed with Et_2O , the aq. layer acidified with HCl, and the product extd. with Et_2O gave 0.237 g. $\text{MeEtC}(\text{OH})\text{CO}_2\text{H}$, $[\alpha]_D^{25}$ 0.015.degree.. Similarly, 3 g. V and LiC.tplbond.CH gave 0.27 g. VI, $[\alpha]_D^{25}$ 0.093.degree.. dl-VI (500 mg.), m. 133.5-4.degree., 300 mg. (+)-p- $\text{O}_2\text{NC}_6\text{H}_4\text{CH}(\text{OH})\text{CH}(\text{NH}_2)\text{CH}_2\text{OH}$, and 0.8 ml. MeOH kept 2 days and the ppt. filtered off gave 200 mg. $\text{C}_{19}\text{H}_{20}\text{N}_2\text{O}_7$, m. 148-9.degree., treated with N HCl to give 14.4 mg. l-VI, $[\alpha]_D^{25}$ -44.4.degree., catalytically reduced over PtO_2 to give 6 mg. l-EtPhC(OH)CO₂H, m. 127-7.5.degree., $[\alpha]_D^{25}$ -33.degree..

IT 7439-93-2, Lithium

(compounds, reactions with α -oxo esters)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 10I (Organic Chemistry: Terpenes)

IT 7439-93-2, Lithium

(compounds, reactions with α -oxo esters)

L32 ANSWER 22 OF 25 HCA COPYRIGHT 2004 ACS on STN

54:97370 Original Reference No. 54:18422c-i,18423a-e Synthesis of β -hydroxy esters from ethyl acetate and ketones or aldehydes by means of lithium amide. Some results with other esters. Dunnavant, Wm. R.; Hauser, Charles R. (Duke Univ., Durham, NC). Journal of Organic Chemistry, 25, 503-7 (Unavailable) 1960. CODEN: JOCEAH. ISSN: 0022-3263.

AB EtOAc was condensed with various ketones or aldehydes including certain α , β -unsatd. ketones or aldehydes by means of 2 equivs. of LiNH_2 in liquid NH_3 to form the corresponding β -hydroxy esters. In general the yields were good. This method was considered more convenient than that

involving the Reformatskii reaction. The products were sapond. and/or dehydrated to give derivs. Condensations of certain other esters with ketones or aldehydes were effected with one or 2 equivs. of LiNH_2 . General procedure: anhyd. NH_3 (400 ml.) treated portionwise with 0.42 mole **Li metal**, after 20 min. a soln. 17.6 g. EtOAc and 50 ml. anhyd. Et₂O added during 1 min., stirred 20 min., 0.20 mole of the ketone or aldehyde added during 1 min., left 1 hr., neutralized with 0.42 mole solid NH_4Cl , the NH_3 evapd. by warm H₂O with addn. of 200-300 ml. Et₂O, 200 ml. cold H₂O added, the Et₂O layer sepd., washed with N H₂SO₄, satd. NaHCO_3 , then H₂O, the Et₂O exts. combined, dried, and evapd., and the residue either vacuum distd. or recrystd. from an appropriate **solvent**. The following results were obtained (ketone or aldehyde, .beta.-hydroxy ester, % yield, m.p. or b.p./mm. given): Ph_2CO , Et .beta.-hydroxy-.beta.,.beta.-diphenylpropionate (I), 84, 85-6.degree.; 4-methylbenzophenone, Et .beta.-hydroxy-.beta.-tolyl-.beta.-phenylpropionate (Ia), 88, 56-7.degree.; PhAc , Et .beta.-hydroxy-.beta.-phenylbutyrate (II), 66, 146-8.degree./15; 3-pentanone, Et .beta.-hydroxy-.beta.,.beta.-diethylpropionate (III), 65, 99-102.degree./13-14; cyclohexanone, Et 1-hydroxycyclohexyl-acetate (IV), 69, 124-6.degree./18; cyclopentanone, Et 1-hydroxycyclopentylacetate (V), 31, 99-102.degree./9; BzH , Et .beta.-hydroxy-.beta.-phenylpropionate (VI), 37, 154-6.degree./12; anisaldehyde, Et .beta.-hydroxy-2-anisylpropionate (VIa), 28, 182-6.degree./17; benzalacetone, Et .beta.-hydroxy-.beta.-styrylbutyrate (VII), 65, 188-91.degree./20; benzalacetophenone, Et .beta.-hydroxy-.beta.-phenyl-.beta.-styrylpropionate (VIII), 93, 74-5.degree.; cinnamaldehyde, 5-phenylpentadienoic acid, 20, 165-6.degree.. I-VII were identified by the prepn. of certain derivs. Sapons. unless otherwise stated were accomplished by refluxing I-VII with 20% aq. NaOH 3 hrs. Dehydrations were effected by the following methods. (A) Dehydration was effected by refluxing a mixt. of the acid, Ac₂O, and NaOAc 3 hrs., H₂O added, the **solvent** distd., and the residue dissolved in Na_2CO_3 , filtered, and acidified. (B) The .beta.-hydroxy ester refluxed 3-4 hrs. with 3 vols. C_6H_6 contg. excess POCl_3 , H₂O added, and the C_6H_6 layer sepd. and evapd. (C) The .beta.-hydroxy ester heated 1 hr. at 130.degree. with solid KHSO_4 and the mixt. distd. in vacuo to yield the unsatd. ester. (D) The .beta.-hydroxy ester refluxed 15 hrs. with 5N HCl , the cooled soln. extd. with Et₂O, the **solvent** evapd., and the residue sapond. by treatment 20 hrs. at room temp. with 3% MeOH-KOH . The following results were obtained (.beta.-hydroxy ester, treatment, product, m.p. or b.p./mm. given): I, sapon., .beta.-hydroxy-.beta.,.beta.-diphenylpropionic acid, 210-11.degree.; I, sapon. dehydration, method A, .alpha.-phenylcinnamic acid, 161-2.degree.; II, dehydration, method B, Et .beta.-methylcinnamate, 146-9.degree./17; II, dehydration, sapon., .beta.-methylcinnamic

acid, 97-8.degree.; III, dehydration, B, Et .beta.,.beta.-diethylacrylate, 74-8.degree./13; III, dehydration, sapon., .beta.,.beta.-diethylacrylic acid, 128-31.degree./23; IV, sapon., 1-hydroxycyclohexylacetic acid, 63-4.degree.; V, dehydration, C, ethylcyclopentylideneacetate, 82-4.degree.; V, dehydration, sapon., cyclopentylideneacetic acid, m. 49-50.degree.; VI, sapon., cinnamic acid, 132-3.degree.; VII, dehydration, sapon. D, .beta.-methyl-.beta.-styrylacrylic acid, 153-3.5.degree.. The Et2O residue contg. Ia stirred with 95% alc. and the solid recrystd. from alc. m. 55-7.degree., .lambda. 2.75 and 5.82 .mu.. II (5 g.) was dehydrated by method A and then sapon. to yield 1.7 g. .beta.-tolylcinnamic acid, m. 139-40.degree. (alc.-H2O). Distn. of the Et2O residue contg. III gave a liquid b13-14 99-102.degree., .lambda. 2.7 and 5.75 .mu.. Distn. of the VIa obtained gave a viscous liquid in 28% yield, b17 182-6.degree., .lambda. 2.75 and 5.7 .mu.. Sapon. of 8 g. gave 5.5 g. .beta.-anisylacrylic acid, m. 172-3.degree.. Evapn. of the Et2O layer contg. VIII gave 95% yield, .lambda. 2.75 and 5.72 .mu.. Attempts to prep. derivs. of VIII led to intractable material. **LiNH2** (from 1.4 g. Li in 400 ml. **NH3**) stirred 1 hr. with 17.6 g. EtOAc and 36.4 g. Ph2CO in 150 ml. Et2O gave 11 g. I and 58% Ph2CO. The above procedure was repeated except that 0.4 mole of **LiNH2** was used rather than 0.2 mole and from the reaction mixt. was obtained 46% I and 55% recovery of Ph2CO. Li (1.7 g.), 12.5 g. iso-Pr acetate, and 21.6 g. Ph2CO gave 27.2 g. isopropyl .beta.-hydroxy-.beta.,.beta.-diphenylpropionate (IX), m. 101-2.degree. (alc.). IX (3 g.) added to 10 ml. cold concd. H2SO4, left 15 min., ice added, and the material treated with dil. NaOH and extd. with Et2O gave 0.7 g. .beta.-phenylcinnamic acid (IXa), m. 162-3.degree. (1:1 MeOH-H2O). Li (1.2 g.), 20 g. tert-Bu acetate, and 31.5 g. Ph2CO gave 36.4 g. tert-butyl .beta.-hydroxy-.beta.,.beta.-diphenylpropionate (X), m. 93-4.degree. (alc.). Repetition of the above reaction with 1 instead of 2 equivs. **LiNH2** gave 71% X. X (3 g.) left 15 min. with ice-cold concd. H2SO4, poured on ice, the solid dissolved in NaOH, the aq. layer acidified, and filtered gave 1.9 g. IXa. Li (1.7 g.), 12.5 g. Et propionate, and 22.2 g. Ph2CO gave 7.3 g. Et .beta.-hydroxy-.beta.,.beta.-diphenyl isobutyrate, m. 98-9.degree.. Li (2.91 g.), 33 g. Et phenylacetate, and 21.5 g. BzH gave 8 g. Et .beta.-hydroxy-.alpha.,.beta.-diphenyl propionate, b3 171-6.degree..

IT 7664-41-7, **Ammonia**
 (liquid, reaction of aldehyde and ketone with esters in)
 RN 7664-41-7 HCA
 CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH3

IT 7782-89-0, **Lithium amide**

(reactions of aldehydes and ketones with esters in presence of)
RN 7782-89-0 HCA
CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

CC 10E (Organic Chemistry: Benzene Derivatives)
IT Aldehydes
Ketones
(reactions of, with esters in presence of LiNH₂)
IT 7664-41-7, Ammonia
(liquid, reaction of aldehyde and ketone with esters in)
IT 7782-89-0, Lithium amide
(reactions of aldehydes and ketones with esters in presence of)
IT 141-78-6, Ethyl acetate
(reactions of, with aldehydes and ketones in presence of
LiNH₂)

L32 ANSWER 23 OF 25 HCA COPYRIGHT 2004 ACS on STN

45:35753 Original Reference No. 45:6113i,6114a-c The oxidation of lithium and the alkaline earth metals in liquid ammonia. Thompson, Joseph K.; Kleinberg, Jacob (Univ. of Kansas, Lawrence). Journal of the American Chemical Society, 73, 1243-5 (Unavailable) 1951. CODEN: JACSAT. ISSN: 0002-7863.

AB Solns. of Na, Ca, Sr, and Ba were rapidly oxidized by dropping the metal sample directly into O-satd. liquid NH₃, and by dissolving the metal in NH₃ and then slowly passing this soln. into a cell contg. O-satd. liquid NH₃ so that oxidation was instantaneous. All the metals yielded chiefly monoxide and small percentages of peroxide; no higher oxides were found in the products. All the metals yield small amts. of amide as indicated by the presence of NO₂⁻ in the oxidation products. With alk. earth metals the products contain traces of unchanged metal, as shown by the evolution of H₂ upon addn. of H₂O. Li, when rapidly oxidized in liquid NH₃ at -78.degree., forms a bright lemon-yellow soln. Oxidized solns. of Li, Na, and K have absorption bands reasonably close to the same wave length, 380 m.mu.. Since Na and K are known to form superoxides upon rapid oxidation in liquid NH₃, the similarity of their absorption spectra to the spectrum of Li supports the postulate that the latter forms a superoxide stable in liquid NH₃ soln. at -78.degree.. Electrolysis of MgBr₂ in liquid NH₃ between a Mg anode and a Pt cathode yields blue solns. of the ionized metal. Oxidation of such solns. results in the formation of small amts. of peroxide; faint, but positive tests for NO₂⁻ also are obtained.

IT 7782-89-0, Lithium amide
(formation in liquid NH₃)

RN 7782-89-0 HCA
CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

IT 7664-41-7, Ammonia
(liquid, oxidation of Li and alk. earth metals in)
RN 7664-41-7 HCA
CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

IT 7439-93-2, Lithium
(oxidation in liquid NH₃)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 6 (Inorganic Chemistry)
IT Lime
(formation of, from Ca and NH₃)
IT Oxidation
(of lithium and alk. earth metals in liquid NH₃)
IT 7789-48-2, Magnesium bromide, MgBr₂
(electrolysis and oxidation in liquid NH₃)
IT 20253-29-6, Barium amide
(formation from oxidation of Ba in liquid NH₃)
IT 1304-28-5, Barium oxide 7782-89-0, Lithium
amide
(formation in liquid NH₃)
IT 7664-41-7, Ammonia
(liquid, oxidation of Li and alk. earth metals in)
IT 1314-11-0, Strontium oxide 7439-93-2, Lithium 7440-24-6,
Strontium
(oxidation in liquid NH₃)
IT 7440-39-3, Barium 7440-70-2, Calcium
(oxidation of, in liquid NH₃)

L32 ANSWER 24 OF 25 HCA COPYRIGHT 2004 ACS on STN
44:22465 Original Reference No. 44:4422g-i,4423a-d Condensations
effected by the alkali amides. IV. The reactions of esters with
lithium amide and certain substituted
lithium amides. Hamell, Matthew; Levine, Robert
(Univ. of Pittsburgh, Pittsburgh, PA). Journal of Organic

Chemistry, 15, 162-8 (Unavailable) 1950. CODEN: JOCEAH. ISSN: 0022-3263. OTHER SOURCES: CASREACT 44:22465.

GI For diagram(s), see printed CA Issue.

AB cf. C.A. 43, 4253g. The condensation of esters in the presence of LiNH_2 (I), LiNEt_2 (II), $\text{LiN}(\text{CHMe}_2)_2$ (III), and LiNMePh (IV) is studied. I is prepd. by adding 3.5 g. Li to 300 cc. stirred anhyd. NH_3 contg. a few crystals of $\text{Fe}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$, then 250 cc. ether after the Li has dissolved, evapg. the NH_3 , and making the mixt. up to 500 cc. with ether. The condensations are carried out by adding 1.1 equivs. ester in anhyd. ether to 1 equiv. I, stirring, refluxing, pouring the mixt., after cooling, onto ice and 100 cc. concd. HCl , extg. with ether, and distg. the residue of the dried ether ext. in vacuo. In this way AcOPr and I, 2 hrs., give 30% $\text{AcCH}_2\text{CO}_2\text{Pr}$, b10 80-1.degree.; AcOCHMe_2 , 3 hrs., 34% $\text{AcCH}_2\text{CO}_2\text{CHMe}_2$, b16 75-9.degree. (Cu salt, m. 174-4.5.degree.); AcOCMe_2 (V), 12 hrs., 28% $\text{AcCH}_2\text{CO}_2\text{CMe}_3$ (VI), b12 71-5.degree.; $\text{PhCH}_2\text{CO}_2\text{Et}$ (VII), 2 (36) hrs., 47% (48%) $\text{PhCH}_2\text{COCHPhCO}_2\text{Et}$ (VIII), m. 77.5-9.degree. (1,4-diphenyl-3-benzyl-5-pyrazolone, m. 231-2.degree.), and 0.7% $\text{PhCH}_2\text{CONH}_2$, m. 152-2.5.degree.; $\text{EtCO}_2\text{CMe}_3$, 3 hrs., 20% $\text{EtCOCHMeCO}_2\text{CMe}_3$, b15 87-9.degree.; PrCO_2Et (IX), 2 hrs., a trace of $\text{PrCOCHEtCO}_2\text{Et}$, b10 87-95.degree., and 5.2% PrCONH_2 , m. 113-14.degree.. VII condensed with itself in ether in the presence of NaNH_2 (X) gives 68% VIII, whereas in the presence of I 47% VIII is formed; in petr. ether VII and X give 50.3% VIII, and VII and I 19.2% at 6 hrs. This large difference in yield may be explained on the basis that the alkali amides function as ion pairs in org. solvents. On the basis of steric and elec. effects the extent to which IV, II, and III attack the .alpha.-H atom of an ester increases in the order given, as is shown by the following results: V and II, 2 hrs., give 58.5% VI; VII and II, 2.5 hrs., 95.5% VIII; EtCO_2Et (XI) and II, 1.5 hrs., 20% Et_2CO , b760 97-103.degree. (2,4-dinitrophenylhydrazone, m. 155-5.5.degree.), in addn. to a yellow N-free oil (XII), b10 90-160.degree., which gives a pos. enol test with FeCl_3 ; XI and III, 0.5 hr., 21.3% $\text{EtCOCHMeCO}_2\text{Et}$ (XIII), b12 88-90.degree., and some XII; XI and IV, 0.25 (1.5) hr., traces of XIII and 44.4% (57%) EtCONMePh , m. 57-7.5.degree.; IX and II, 1.5 hrs., 20% Pr_2CO , b760 141-7.degree. (2,4-dinitrophenylhydrazone, m. 74.5-5.degree.), and a yellow N-free oil, b4 75-142.degree., which gives a pos. enol test; $\text{Me}_2\text{CHCO}_2\text{Et}$ (XIV) and II, 3.5 (15) hrs., 16 (3.5)% $(\text{Me}_2\text{CH})_2\text{CO}$, b760 121-6.degree. (2,4-dinitrophenylhydrazone, m. 87-8.degree.) and (5.6%) $\text{Me}_2\text{CHCONEt}_2$, b14 76-7.degree., b760 192-4.degree.; XIV and III, 0.25 (3) hrs., 47.1 (49.3)% $\text{Me}_2\text{CHCOCMe}_2\text{CO}_2\text{Et}$, b14 87-90.degree.; $\text{Me}_2\text{CHCH}_2\text{CO}_2\text{Et}$ and II, 3 hrs., 46.6% $(\text{Me}_2\text{CHCH}_2)_2\text{CO}$, b760 170-4.degree. (semicarbazone, m. 121-1.5.degree.), and 6.6% $\text{Me}_2\text{CHCH}_2\text{CONEt}_2$, b14 93-5.degree.; $\text{C}_8\text{H}_{17}\text{CO}_2\text{Et}$ and II, 1.5 hrs., 44.1% $(\text{C}_8\text{H}_{17})_2\text{CO}$, m. 50-50.5.degree..

IT 7439-93-2, Lithium

(compds., of secondary amines, condensation of esters by)

RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7782-89-0, Lithium amide
(ester condensation by)
RN 7782-89-0 HCA
CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

CC 10 (Organic Chemistry)
IT 7439-93-2, Lithium
(compds., of secondary amines, condensation of esters by)
IT 7782-89-0, Lithium amide 35954-01-9,
Aniline, N-methyl-, lithium deriv.
(ester condensation by)

L32 ANSWER 25 OF 25 HCA COPYRIGHT 2004 ACS on STN
5:10300 Original Reference No. 5:1881f-h Lithium Imide and Comments on
the Work of Dafert and Micklauz on "Some New Compounds of Nitrogen,
Hydrogen and Lithium". Ruff, O.; Goerges, H. Ber., 44, 502-6
(Unavailable) 1911.

AB The trilithium ammonium, Li₃NH₄ of D. and M. (C. A., 5, 1030) is
looked upon as a mixture of LiNH₂ and LiH. When heated
the LiNH₂ yields Li₂NH and NH₃, the latter with
the LiH yielding LiNH₂, which in turn gives Li₂NH and
NH₃. The comp. of the mixture of Li₂NH and LiH obtained
approximates to Li₃NH₂. From liq. NH₃ and Li, R. and H.
prepared LiNH₂, which is cryst., and when heated
in an Ag crucible in a sealed tube, melts at 373-375.degree.
(corr.), and under NH₃, pressure sublimes undecomposed.
By gradually raising the temp. in a constantly maintained vacuum,
and finally to 450.degree., LiNH₂ is quant. changed to
LiNH, some of the NH₃ produced being dissoc. At temps.
above 600.degree., the imide, without melting, gives off the
characteristic blue LiNH₄ compd. and leaves behind a white powder.
The Li₂NH has d₁₉ 1.303 is insol. in C₇H₉, C₆H₆, Et₂O and AcOEt;
produces alcoholates and NH₃ with EtOH and NH₄OH;
decomposes CHCl₃; and reacts with pyridine, aniline and quinoline
with vigorous evolution of NH₃.

IT 7439-93-2, Lithium
(compds., with hydrogen and N)
RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 6 (Inorganic Chemistry)

IT 7439-93-2, Lithium
(compds., with hydrogen and N)

=> d 133 1-20 ti

L33 ANSWER 1 OF 20 HCA COPYRIGHT 2004 ACS on STN

TI Interaction between **Lithium Amide** and Lithium
Hydride

L33 ANSWER 2 OF 20 HCA COPYRIGHT 2004 ACS on STN

TI [Li(**NH3**)₄][Sn(SnPh₃)₃].cntdot.C₆H₆, crystal structure of a
stannide with trigonal pyramidal tin skeleton

L33 ANSWER 3 OF 20 HCA COPYRIGHT 2004 ACS on STN

TI Preparation of methyl cis-9, trans-11- and trans-9,
trans-11-octadecadienoate-17,17,18,18-d₄, two of the isomers of
conjugated linoleic acid

L33 ANSWER 4 OF 20 HCA COPYRIGHT 2004 ACS on STN

TI Synthesis and crystal structure of a mixed-valence lithium tantalum
nitride Li₂Ta₃N₅

L33 ANSWER 5 OF 20 HCA COPYRIGHT 2004 ACS on STN

TI New ternary alkali metal hydroxides, MLi₂(OH)₃ with M = K, Rb, Cs
and a cesium dilithium amide, CsLi₂(NH₂)₃ - structural relations to
the BaNiO₃-type and to LiOH

L33 ANSWER 6 OF 20 HCA COPYRIGHT 2004 ACS on STN

TI The electronic structure of the monomers, dimers, a trimer, the
oxides and the borane complexes of the lithiated **ammonias**

L33 ANSWER 7 OF 20 HCA COPYRIGHT 2004 ACS on STN

TI Evaluation of the collision stopping power of elements and compounds
for electrons and positrons

L33 ANSWER 8 OF 20 HCA COPYRIGHT 2004 ACS on STN

TI Low-frequency Raman studies of metal-**ammonia** solutions

L33 ANSWER 9 OF 20 HCA COPYRIGHT 2004 ACS on STN

TI Raman spectroscopy studies of metal-**ammonia** solutions

- L33 ANSWER 10 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Electron spin resonance studies of the reaction of lithium atoms with Lewis bases in argon matrices: formation of reactive intermediates. 1. Water and **ammonia**
- L33 ANSWER 11 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Molecular orbital theory of the electronic structure of molecules. 34. Structures and energies of small compounds containing lithium or beryllium. Ionic, multicenter, and coordinate bonding
- L33 ANSWER 12 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Regioselectivity in the reductive cleavage of syn- and anti-2-methylspiro[cyclopropane-1,1'-indene]. Elucidation of the role of steric effects
- L33 ANSWER 13 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Analysis of lithium deuteriotritide
- L33 ANSWER 14 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Acrylonitrile polymerization in liquid **ammonia**
- L33 ANSWER 15 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Polymerization of acrylonitrile and butyl methacrylate in liquid **ammonia** in the presence of **metallic lithium** and **lithium amide**
- L33 ANSWER 16 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Selective alkylation of the three classes of acetylenic alcohols; protection of the hydroxyl group by means of lithium
- L33 ANSWER 17 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Condensations. LI. Role of metallic cation in aldol condensation of metallo esters with acetophenone to form .beta.-hydroxy esters. Reversal to Claisen acylation or self-condensation of the ketone
- L33 ANSWER 18 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Rearrangements in amination by alkali amides in liquid **ammonia** and by lithium dialkylamides in ether
- L33 ANSWER 19 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI Application of lithium alkynyls in the synthesis of long-chain dialkylacetylenes
- L33 ANSWER 20 OF 20 HCA COPYRIGHT 2004 ACS on STN
TI New Compounds of Nitrogen and Hydrogen with Lithium. II

=> d 133 15,18,20 cbib abs hitstr hitind

L33 ANSWER 15 OF 20 HCA COPYRIGHT 2004 ACS on STN

60:75653 Original Reference No. 60:13325e-f Polymerization of acrylonitrile and butyl methacrylate in liquid ammonia in the presence of metallic lithium and lithium amide. Askarov, M. A.; Stratu, Z. A. Uzbekskii Khimicheskii Zhurnal, 7(6), 66-70 (Unavailable) 1963. CODEN: UZKZAC.

AB Li (0.0222 g.) was dissolved in 50 cc. liquid NH3 at -60.degree., 6 g. acrylonitrile (I) was added, and the NH3 was distd. to give 5.1304 g. of a yellowish polymer, sp. viscosity 0.23. I was polymerized in the presence of LiNH2 similarly to give an 89% yield of polymer. Increasing the amt. of LiNH2 from 0.011 to 0.12 mole/mole I led to a polymer yield of 87.9-96.9%. The yield also increased with an increased amt. of Li and with a longer polymerization time. The most suitable polymerization conditions were 0.028 mole of Li or 0.026 mole LiNH2/mole I, and the degree of polymerization after 5-10 min. was 28-30. Bu methacrylate (II) was polymerized in the same way as I with the use of LiNH2; however, to attain a 60% yield of polymer it was necessary to use a 1:1 molar ratio of II: LiNH2; only at -40.degree., was it possible to reduce the LiNH2-II ratio to 0.46 mole/mole and to carry out the polymerization within 2 hrs. The sp. viscosity of the polymer was 0.8.

IT 7439-93-2, Lithium
(catalysts in polymerization, of acrylonitrile or butyl methacrylate in liquid NH3)

RN 7439-93-2 HCA

CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

IT 7782-89-0, Lithium amide
(catalysts, in polymerization of acrylonitrile or Bu methacrylate in liquid NH3)

RN 7782-89-0 HCA

CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH2

IT 7664-41-7, Ammonia
(polymerization of acrylonitrile or butyl methacrylate in liquid, Li or Li amide catalysts in)

RN 7664-41-7 HCA

CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃

- CC 45 (Synthetic High Polymers)
IT Catalysts and Catalysis
(in polymerization, of acrylonitrile and butyl methacrylate in liquid **NH₃**, Li or **Li amide** as)
IT Polymerization
(of acrylonitrile and Bu methacrylate in liquid **NH₃**, Li-Li **amide** catalysts in)
IT 7439-93-2, Lithium
(catalysts in polymerization, of acrylonitrile or butyl methacrylate in liquid **NH₃**)
IT 7782-89-0, Lithium amide
(catalysts, in polymerization of acrylonitrile or Bu methacrylate in liquid **NH₃**)
IT 29403-26-7, Methacrylic acid, polymer with 2-methoxyethyl methacrylate and methyl methacrylate
(in liquid **NH₃**, Li or **Li amide** as catalyst in)
IT 7664-41-7, Ammonia
(polymerization of acrylonitrile or butyl methacrylate in liquid, Li or **Li amide** catalysts in)
IT 107-13-1, Acrylonitrile
(polymerization of, Li or **Li amide** as catalysts in, in liquid **NH₃**)

L33 ANSWER 18 OF 20 HCA COPYRIGHT 2004 ACS on STN

48:56526 Original Reference No. 48:9942a-h Rearrangements in amination by alkali amides in liquid **ammonia** and by lithium dialkylamides in ether. Gilman, Henry; Kyle, Robert H. (Iowa State Coll., Ames). Journal of the American Chemical Society, 74, 3027-9 (Unavailable) 1952. CODEN: JACSAT. ISSN: 0002-7863.

AB The reaction of .omicron.-haloanisoles and metal amides was shown by a typical procedure. The .omicron.-haloanisole (0.5 mole) was added to 1 mole NaNH₂ in liquid **NH₃** over 0.5 hr. period, the mixt. stirred an addnl. 20 min., and 1 mole NH₄Cl added during 10-15 min. (over-all time 1 hr.), 250 cc. of C₆H₆ added, the mixt. warmed to expel **NH₃**, and the solids filtered and extd. with C₆H₆. HCl bubbled into the combined C₆H₆ solns. pptd. the HCl salt of m-anisidine (I) from which the free I was liberated, b0.15 75-7.degree., n₂₀D 1.5809. The following results were obtained [metal, halogen, molar ratio amide-RX, % yield (gross) of I, % recovery of RX given]: Na, Cl, 2:1, 46.5, -; Na, Cl, 2:1, 42.5, -; Na, Cl, 4:1, 51.0, -; Na, Cl, 4:1, 55.1, 3.7; Na, Cl, 4:1, 51.5, -; Na, Cl, 4:1, 35.9, 31.1; Na, Cl, 4:1 (reaction time 2.5 hrs.), 25.7, -; Na, Cl, 8:1, 42.9, -; Li, Cl, 2:1, 0.0, 65.2; Li, Cl, 2:1, 0.0,

90.3; Li, Br, 2:1 (1.3 hrs.), 5.4, 75.7; K, Cl, 2:1, 44.4, 25.4; K, Cl, 2:1 (0.75 hr.), 33.3, 26.6; K, Cl, 4:1 (0.33 hr.), 35.6, 28.0. The following general procedure was used in LiNEt₂ studies. MeLi (0.25 mole) was added to 0.28 mole of NH₄Et₂ in Et₂O under N, 0.25 mole .omicron.-haloanisole added and the whole refluxed 24 hrs., hydrolyzed, the Et₂O layer extd. with HCl, the acid soln. treated with NaOH to liberate the free base, m-methoxydiethylaniline (II), b₁₄ 146-8.degree., b_{0.5} 87-9.degree., n_{20D} 1.5437; picrate, yellow prisms, m. 145-6.degree.. An authentic sample of II was prepd. from m-hydroxydiethylaniline, Me₂SO₄, and NaOH. The following results were obtained [halogen, % yield (gross) of II, % recovery of .omicron.-haloanisole, % net yield of II, % yield of anisole (by-product) given]: iodine, 5.4, 22.9, 6.9, 22.2; Br, 32.8, 25.3, 43.8, 9.6; Cl, 26.4, 23.9, 34.6, 7.4; F, 26.2, -, -, -. m-Chloroanisole reacts immediately with Et₂NLi, to give after 2 hrs. refluxing a 48% yield of II. .omicron.-Bromophenol (0.1 mole) and 0.2 mole of Et₂NLi were refluxed 98 hrs. in Et₂O to yield 15% m-diethylaminophenol or allowing for a recovery of 43% .omicron.-bromophenol, the net yield was 26%. Identity was established by conversion to m-diethylaminoanisole with Me₂SO₄ and then prepg. the picrate, m. 145.5-6.0.degree.. Bu₂NLi similarly reacted with .omicron.-chloroanisole to give a 48% yield of m-methoxydibutylaniline (III), b_{1.9} 136.5-8.5.degree., n_{20D} 1.5205, d₂₀ 0.951, MR 75.4 (calcd. 76.7); picrate, m. 95-6.degree.. An authentic sample III prepd. by heating 0.18 mole m-anisidine, 0.54 mole BuI, 0.24 mole Na₂CO₃, and H₂O for 5 hrs., adding Ac₂O and 20% NaOH, extg. the mixt. with HCl, and freeing the amine with base. .omicron.-Chlorophenetole and Et₂NLi refluxed together for 24 hrs. gave 21% starting material, 27% phenetole (characterized by cleavage to PhOH and prepn. of 2,4,6-tri-Br deriv.) and 38% m-diethylaminophenetole (IV). Authentic IV was prepd. from m-diethylaminophenol and Et₂SO₄, b_{0.6} 97-8.degree., n_{20D} 1.5342; picrate, m. 132-3.degree.. Li piperidide (from 0.2 mole MeLi and 0.22 mole piperidine) was refluxed 24 hrs. with 0.2 mole .omicron.-bromoanisole (V) to yield 41% (allowing for a 34% recovery of V) m-piperidinoanisole (VI), b_{0.2} 110.degree., n_{20D} 1.5628, d₂₀ 1.059, MR 58.8; picrate, m. 159.5-60.degree.. VI was identified by comparison with the picrate formed from m-chloroanisole and Li piperidide. Li morpholide (from MeLi and 0.23 mole morpholine) was added to V (0.2 mole) in Et₂O and refluxed for 24 hrs. to give 8.6% yield of m-morpholinoanisole (VII), b_{0.15} 113.degree., n_{20D} 1.5650; picrate, m. 196-7.degree.. VII was also obtained from Li morpholide and m-chloroanisole. Et₂NLi (0.22 mole) and 0.09 mole p-dibromobenzene were refluxed 25 hrs. in Et₂O to yield 15% diethylaniline (picrates, m. 137-8.degree.) and 14% p-bromodiethylaniline (picrates, m. 165-6.degree.). From another expt. in which 0.1 mole each of the reagents were used, there was obtained 23% p-bromodiethylaniline.

IT 7439-93-2, Lithium
(compds., of secondary amines, rearrangements in their reactions
with o-halo derivs. of anisole, phenetole and phenol)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li
IT 7664-41-7, Ammonia
(liquid, rearrangement amination by alkali metal amides in)
RN 7664-41-7 HCA
CN Ammonia (8CI, 9CI) (CA INDEX NAME)

NH₃
IT 7782-89-0, Lithium amide
(reaction with o-haloamisoles, rearrangements in)
RN 7782-89-0 HCA
CN Lithium amide (Li(NH₂)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li-NH₂

CC 10 (Organic Chemistry)
IT Alkali metal amides
(amination by, in liquid NH₃, rearrangements in)
IT Rearrangements
(in amination by alkali metal amides in liquid NH₃)
IT 7439-93-2, Lithium
(compds., of secondary amines, rearrangements in their reactions
with o-halo derivs. of anisole, phenetole and phenol)
IT 7664-41-7, Ammonia
(liquid, rearrangement amination by alkali metal amides in)
IT 7782-89-0, Lithium amide
(reaction with o-haloamisoles, rearrangements in)

L33 ANSWER 20 OF 20 HCA COPYRIGHT 2004 ACS on STN
6:7078 Original Reference No. 6:1105c-e New Compounds of Nitrogen and
Hydrogen with Lithium. II. Dafert, F. W.; Miklauz, R. Monatshefte
fuer Chemie, 33, 63-9 (Unavailable) 1912. CODEN: MOCMB7. ISSN:
0026-9247.

AB cf. C. A., 5, 1030, 2226. Li unites readily with H at and above
700.degree., forming a glassy opalescent mass, changing color under
influence of light. This hydride heated in N to 600.degree. lost H
and gained N, forming the imide Li₂NH. This imide is the cause of
the sensitiveness to light, decomposing thus: 2Li₂NH = Li₃N +

LiNH₂; $2\text{LiNH}_2 = \text{Li}_2\text{NH} + \text{NH}_3$; $2\text{Li}_3\text{N} + \text{NH}_3$
= $3\text{Li}_2\text{NH}$. Li_3N obtained in the cold unites with **NH₃** at
350.degree., $\text{Li}_2\text{N} + 2\text{NH}_3 = 3\text{LiNH}_2$, a white cryst. mass. Cryst.
nitride unites only at 410.degree.. Li_2NH unites with H at
450.degree. to form Li_3NH_2 . This, at 600.degree., absorbs N to form
 Li_2NH , suggesting a new way of absorbing N from the air.

IT **7439-93-2**, Lithium
(compds., with hydrogen and N)
RN 7439-93-2 HCA
CN Lithium (7CI, 8CI, 9CI) (CA INDEX NAME)

Li

CC 6 (Inorganic Chemistry)
IT **7439-93-2**, Lithium
(compds., with hydrogen and N)